North Carolina Department of Transportation
Statewide Planning Branch
Small Urban Planning Unit

Thoroughfare Plan for

January 2003

Davie County
Thoroughfare Plan

Prepared by the:

Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In cooperation with:

Davie County
The Federal Highway Administration
U.S. Department of Transportation

January 2003

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Acknowledgments

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Special thanks to Mr. John Gallimore, Director - Davie County Planning & Zoning, who provided invaluable assistance in the development and adoption of the thoroughfare plan.

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Executive Summary

This plan documents the findings of a thoroughfare plan study for Davie County. Below is a listing and brief description of these findings. A more detailed discussion of these recommendations can be found in Chapter 2.

Interstates

I-40

TIP Project I-911. Pavement rehabilitation and the construction of fifth and sixth lanes from west of NC 801 (Exit 180) in Davie County to west of SR 1122 in Forsyth County.

Construct fifth and sixth lanes from NC 801 to the eastern MUPB (Mocksville Urban Planning Boundary) and from the western MUPB to Iredell County.

Minor Arterials

US 601

Widen to 4-lanes from SR 1414 (Ferebee Road) to I-40 and from SR 1801 (Deadmon Road) to Rowan County.

US 64

TIP Project R-3602 (*Unfunded*). Widen to multi-lanes from US 601 south of Mocksville to US 52 in Lexington. Upgrade interchange at US 52.

US 158

Widen to 5-lanes from the Hillsdale Town Limits to NC 801.

Widen to 4-lanes at the following locations:

- from Forsyth County to the Hillsdale Town Limits
- from NC 801 to SR 1442 (Redland Road)
- from SR 1410 (Farmington Road) to the northern MUPB

Major Collectors

US 64

Widen to 4-lanes from the western MUPB to Iredell County.

NC 801

TIP Project R-3610 (*Unfunded*). Upgrade roadway from SR 1650 (Peoples Creek Road) to SR 1624 (Old NC 801). Widen roadway to multi-lanes from SR 1624 (Old NC 801) to US 158.

Widen to 4-lanes from US 158 to SR 1410 (Farmington Road) and from US 601 to Rowan County.

Minor Collectors

SR 1139 (Jericho Road)

Widen to 24-ft. cross section from SR 1147 (Davie Academy Road) to SR 1121 (Gladstone Road).

SR 1143 (Davie Academy Road)

Widen to 24-ft. cross section from US 64 to I-40.

SR 1801 (Deadmon Road)

Widen to 24-ft. cross section from US 601 to NC 801.

SR 1802 (Turrentine Road)

Widen to 24-ft. cross section from NC 801 to the End of State Maintenance.

SR 1410 (Farmington Road)

Widen to 4-lanes from NC 801 to US 158.

Intersection Improvements

SR 1611 (Fork Bixby Road) / SR 1630 (Baltimore Road)

Realign roadways to form a single intersection with continuous through movement. Upgrade rail crossing on SR 1611 (Fork Bixby Road) just south of SR 1616 (Cornatzer Road).

SR 1632 (Junie Beauchamp Road) / US 158

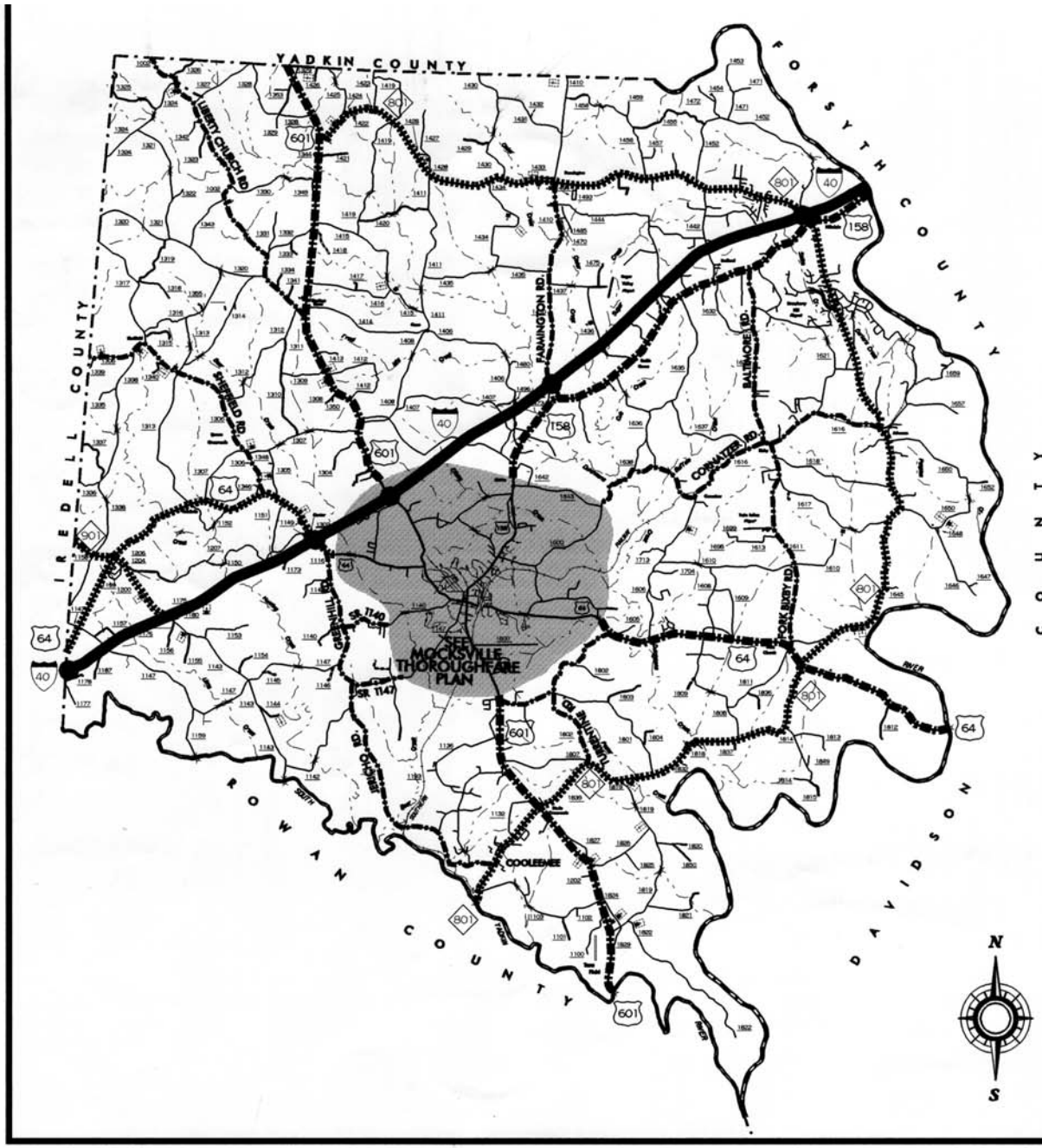
Realign roadways to form a single intersection with continuous through movement. Upgrade SR 1632 (Junie Beauchamp Road) to 2-12' lanes and realign roadway to improve horizontal alignment deficiencies.

NC 801 / US 158

Addition of a dedicated right turn lane at the intersection of US 158 and NC 801 North with increased stack room to accommodate traffic turning onto US 158 East.

Increased stack room for the dedicated left turn lane on NC 801 North turning onto US 158 West.

Addition of a dedicated right turn lane on US 158 West turning onto NC 801 North.



Legend

	Existing	Proposed
Interstate		
Principal Arterial		
Minor Arterial		
Major Collector		
Minor Collector		
Interchange		
Urban Planning Boundary		

ADOPTED BY:

Davie County	AUGUST 19, 2002
Recommended By: Statewide Planning Branch	OCTOBER 10, 2002
N.C. Department of Transportation	NOVEMBER 7, 2002

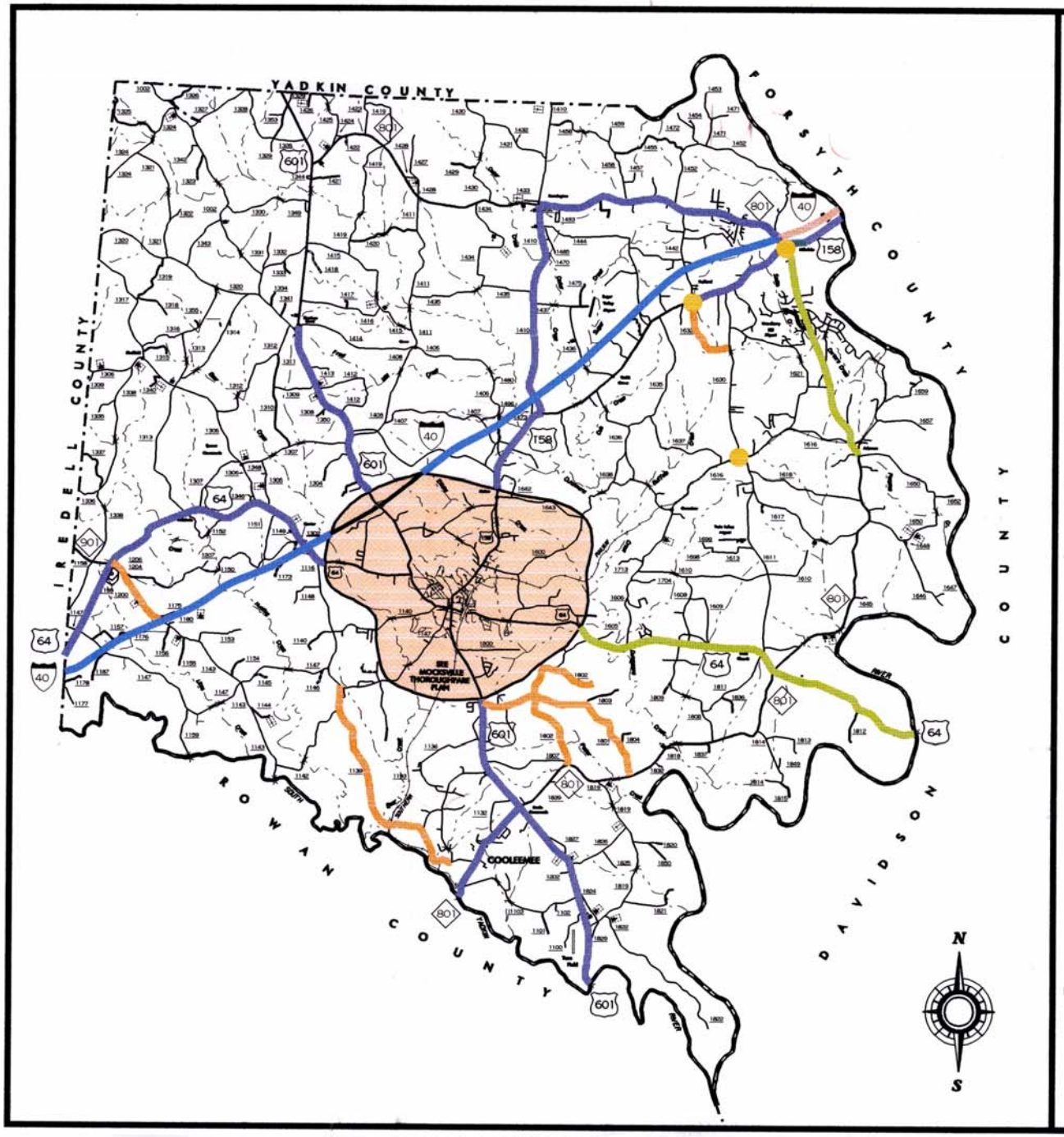
THOROUGHFARE PLAN
AUGUST 19, 2002

DAVIE COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE
0 1 2 3 4 MILES

FIGURE 2



RECOMMENDATIONS

AUGUST 19, 2002

Legend

- WIDEN TO 12 FT LANES
- WIDEN TO 4 – LANES
- WIDEN TO 5 – LANES
- WIDEN TO 6 – LANES
- TIP PROJECT (FUNDED)
- TIP PROJECT (UNFUNDED)
- INTERSECTION IMPROVEMENT
- URBAN PLANNING BOUNDARY

DAVIE COUNTY

NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE

0 1 2 3 4 MILES

FIGURE 3

Chapter 1
Introduction

Overview

Officials of Davie County, prompted by a desire to adequately plan for future transportation needs, requested the North Carolina Department of Transportation's (NCDOT) assistance in conducting a thoroughfare plan study. The County Commissioners' primary concern was the increased development in the central and eastern portions of Davie County, as well as potential future growth associated with the construction of the Mocksville Bypass (*see the 1992 Town of Mocksville Thoroughfare Plan*). A thoroughfare plan study was requested to determine the impact of this development on the existing transportation system.

The objective of thoroughfare planning is to enable a transportation system to be progressively developed to adequately meet the transportation needs of a community, or region, as land develops and traffic volumes increase. It is essential to plan now for future transportation needs in order to avoid unnecessary costs to the physical, social, and economic environment. Thoroughfare planning is a tool that can be used by local officials to plan for future transportation needs, while at the same time reducing costs to our environment.

The primary purpose of this report is to present the findings and recommendations of the thoroughfare plan study conducted for Davie County. The secondary purpose of this report is to document the basic thoroughfare planning principles and procedures used in developing these recommendations. This report can be divided into three parts. The first part of the report, covered in Chapter 1, covers the highlights of the study. Chapters 2 and 3 provide a detailed description of the thoroughfare plan study recommendations and address different methods by which these recommendations can be implemented. The final chapter, Chapter 4, covers study procedures and details findings.

Information that will be especially useful to the practitioners is provided in the Appendices. The principles of thoroughfare planning are covered in Appendix A. A detailed tabulation of all routes on the thoroughfare plan and a graphical representation of typical cross sections can be found in Appendices B and C, respectively. Information related to subdivision ordinances is covered in Appendix D. Appendix E provides an index for secondary road numbers for Davie County. Appendix F addresses the process of requesting Transportation Improvement Program Projects. Appendix G documents and evaluates projects that were reviewed, but not include in the thoroughfare plan. Public involvement tools and strategies are documented in Appendix H. All urban thoroughfare plans within Davie County are shown in Appendix I. Finally, Appendix J contains contact information for key NCDOT personnel for the area.

Background

Davie County is located in the central section of the State and is bounded by Davidson, Forsyth, Iredell, Rowan, and Yadkin counties. Davie County has a total area of 266.54 square miles, with 264.89 square miles of land area. The geographic location for Davie County is shown in Figure 1.

Davie County was formed in 1836 from Rowan. It was named in honor of William Richardson Davie, a distinguished Revolutionary soldier, a member of the Federal Convention of 1787, Governor of North Carolina, special envoy extraordinary and minister plenipotentiary to France, and one of the founders of the University of North Carolina. Mocksville, incorporated in 1839, is the county seat. Today, Davie County has a diversified economic base. The manufacturing, retail and service industries are key economic foundations. Recreational pursuits have also become a basis for serious business in the county.

Land use in the county is primarily a mixture of agricultural, commercial, and residential development, with the majority of commercial development being in and around the county's incorporated municipalities.

The major routes in Davie County include I-40, US 601, US 158, US 64, NC 901, and NC 801.

Highlights

Major highlights of the 2002 Davie County Thoroughfare Plan are outlined below. The Thoroughfare Plan is shown in Figure 2 and the Recommended Improvements are shown in Figure 3. Projects included in the 2002-2008 Transportation Improvement Program (TIP) are also given below.

I-40

TIP Project I-911. Pavement rehabilitation and the construction of fifth and sixth lanes from west of NC 801 (Exit 180) in Davie County to west of SR 1122 in Forsyth County.

Construct fifth and sixth lanes from NC 801 to the eastern MUPB (Mocksville Urban Planning Boundary) and from the western MUPB to Iredell County.

US 601

Widen to 4-lanes from SR 1414 (Ferebee Road) to I-40 and from SR 1801 (Deadmon Road) to Rowan County.

US 158

Widen to 5-lanes from the Hillsdale Town Limits to NC 801.

Widen to 4-lanes at the following locations:

- from Forsyth County to the Hillsdale Town Limits
- from NC 801 to SR 1442 (Redland Road)
- from SR 1410 (Farmington Road) to the northern MUPB

Addition of a dedicated right turn lane on US 158 West turning onto NC 801 North.

US 64

TIP Project R-3602 (*Unfunded*). Widen to multi-lanes from US 601 south of Mocksville to US 52 in Lexington. Upgrade interchange at US 52.

Widen to 4-lanes from the western MUPB to Iredell County.

NC 801

TIP Project R-3610 (*Unfunded*). Upgrade roadway from SR 1650 (Peoples Creek Road) to SR 1624 (Old NC 801). Widen roadway to multi-lanes from SR 1624 (Old NC 801) to US 158.

Widen to 4-lanes from US 158 to SR 1410 (Farmington Road) and from US 601 to Rowan County.

Addition of a dedicated right turn lane at the intersection of US 158 and NC 801 North with increased stack room to accommodate traffic turning onto US 158 East.

Increased stack room for the dedicated left turn lane on NC 801 North turning onto US 158 West.

SR 1410 (Farmington Road)

Widen to 4-lanes from NC 801 to US 158.

SR 1611 (Fork Bixby Road) / SR 1630 (Baltimore Road)

Realign roadways to form a single intersection with continuous through movement. Upgrade rail crossing on SR 1611 (Fork Bixby Road) just south of SR 1616 (Cornatzer Road).

SR 1632 (Junie Beauchamp Road) / US 158

Realign roadways to form a single intersection with continuous through movement. Upgrade SR 1632 (Junie Beauchamp Road) to 2-12' lanes and realign roadway to improve horizontal alignment deficiencies.

Widen to 24' pavement (2-12' lanes) projects.

- SR 1139 (Jericho Road) from SR 1147 (Davie Academy Road) to SR 1121 (Gladstone Road).
- SR 1143 (Davie Academy Road) from US 64 to I-40.
- SR 1801 (Deadmon Road) from US 601 to NC 801.
- SR 1802 (Turrentine Road) from NC 801 to the End of State Maintenance.

The North Carolina Department of Transportation and Davie County are jointly responsible for the proposed thoroughfare improvements. Cooperation between the State and the County is of primary concern if the recommendations outlined above are to be successfully implemented. All

parties have mutually adopted the thoroughfare plan, and it is the responsibility of the County to implement the plan following the guidelines set forth in Chapter 3. This plan was adopted by Davie County on August 19, 2002 and by the North Carolina Department of Transportation on November 7, 2002.

It is important to note that the recommended plan is based on anticipated growth of the county as indicated by past trends and future projections. Prior to construction of projects proposed herein, a more detailed study will be required to reconsider development trends and to determine specific locations and design requirements.

GEOGRAPHIC LOCATION
FOR
DAVIE COUNTY
NORTH CAROLINA

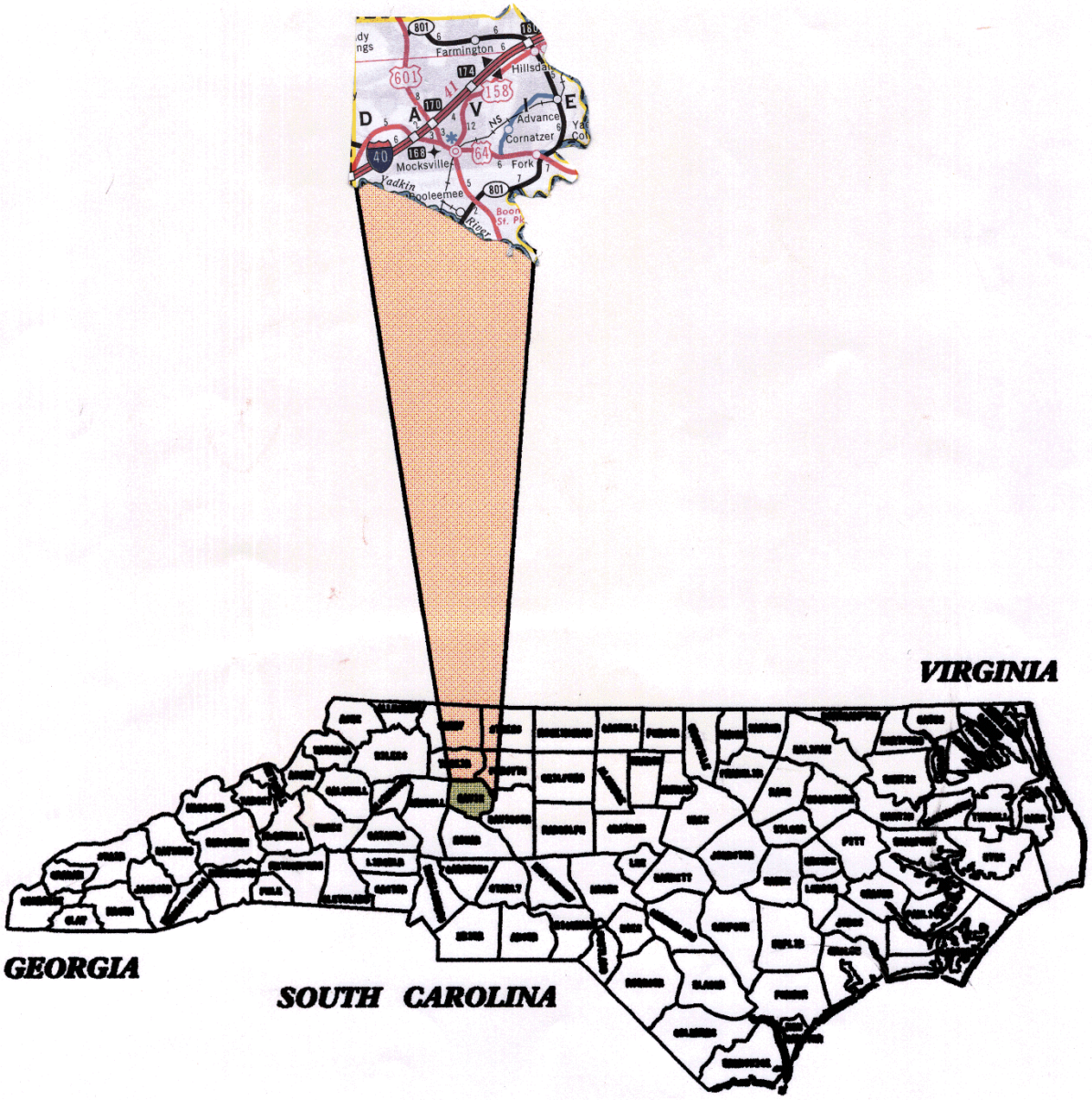
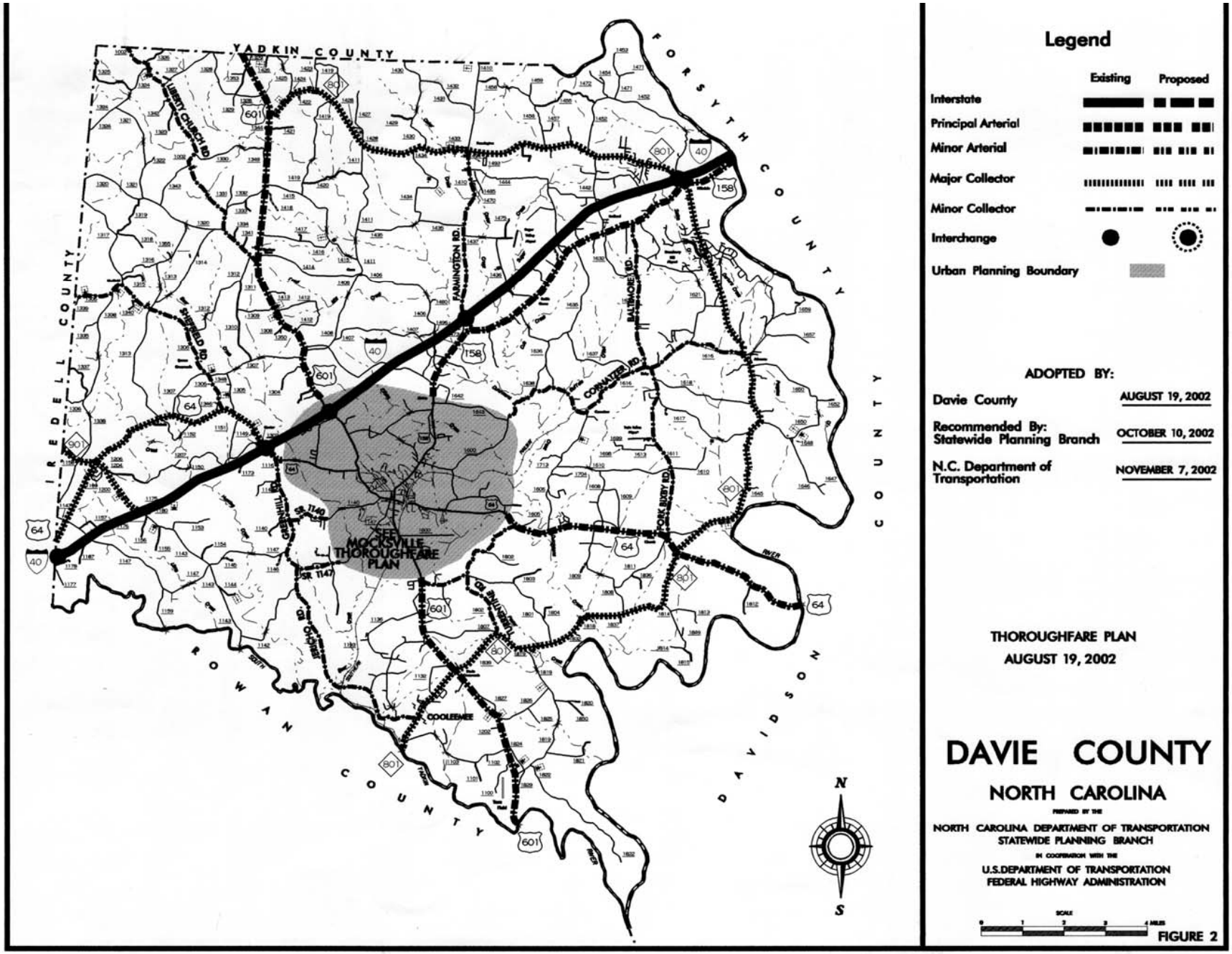


FIGURE 1



Legend

	Existing	Proposed
Interstate		
Principal Arterial		
Minor Arterial		
Major Collector		
Minor Collector		
Interchange		
Urban Planning Boundary		

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Davie County	AUGUST 19, 2002
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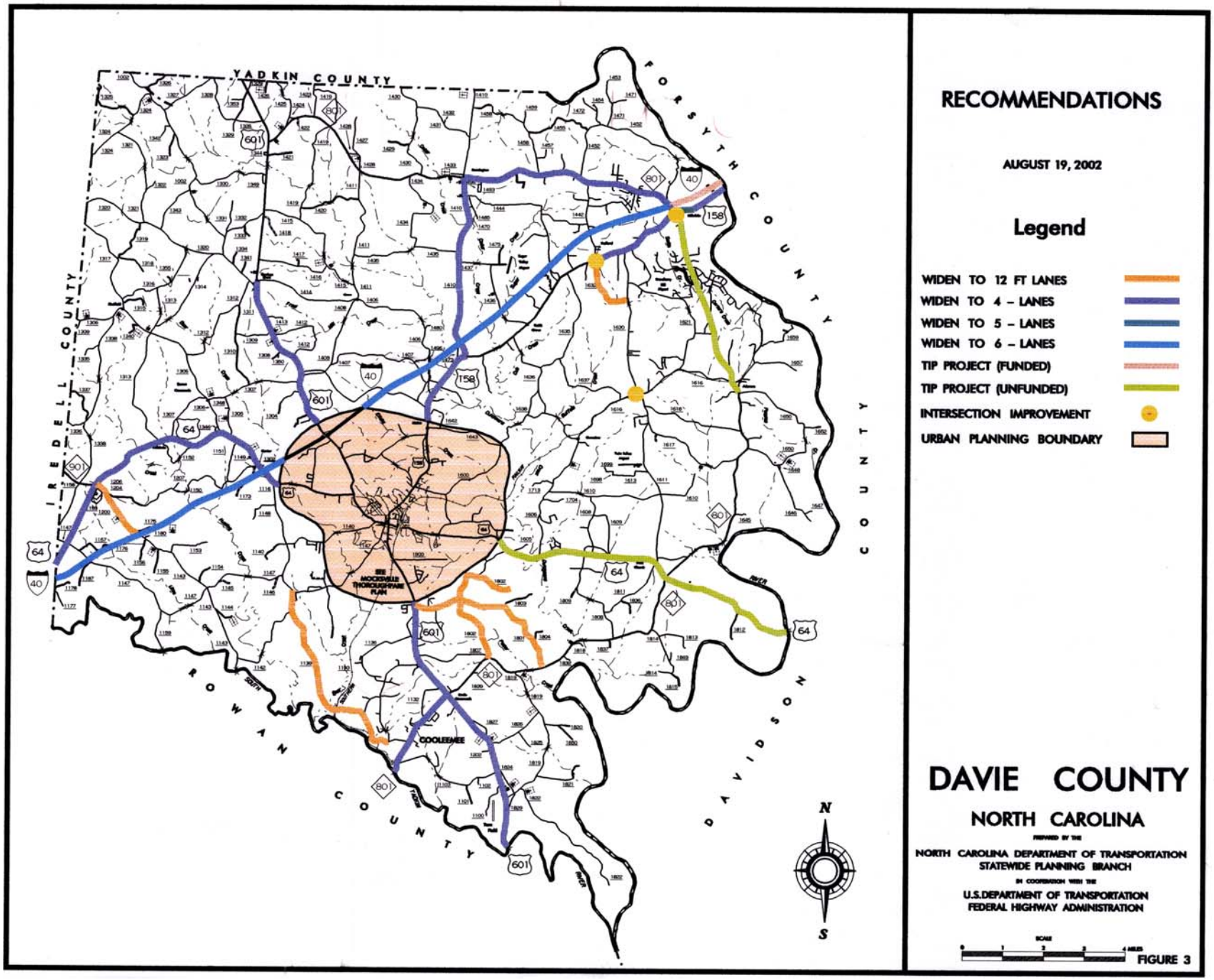
SCALE 0 1 2 3 4 MILES

FIGURE 2


YADKIN COUNTY
FORSYTH COUNTY
IREDELL COUNTY
DAVIDSON COUNTY
ROWAN COUNTY
COOLEEMEE
RECOMMENDATIONS
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FEDERAL HIGHWAY ADMINISTRATION
SCALE
FIGURE 3

Chapter 2
Recommended Thoroughfare Plan

Intent of the Thoroughfare Plan

Transportation is the backbone of a region's economic vitality. Without an adequate transportation system people cannot easily reach their intended destination, goods cannot be delivered in a cost effective manner, and investors may look to invest in better served areas. Recent trends such as regional economies, "just in time" delivery, increased automobile ownership, and increased migration away from the central cities and towns are taxing existing transportation systems and requiring that more emphasis be placed on planning for our transportation future.

A thoroughfare plan study identifies existing and future deficiencies in a transportation system, as well as uncovers the need for new facilities. A county thoroughfare plan also provides a representation of the existing highway system by functional use. This use can be characterized as a part of the arterial road system, the collector road system, or the local street system. A full description of these various systems and their subsystems is given in Appendix A.

This chapter presents the thoroughfare plan recommendations. The goal of this study is to propose a transportation system that will serve the anticipated traffic and land development needs of Davie County. The primary objective of this plan is to reduce traffic congestion and improve safety by eliminating both existing and projected deficiencies in the transportation system.

Thoroughfare Plan Recommendations

The process of developing and evaluating thoroughfare plan recommendations involves many considerations, including the goals and objectives of the area, identified roadway deficiencies, environmental impacts, existing and anticipated land development, and travel services. Chapter 4 contains the documentation of the analysis involved in developing the recommendations for Davie County. A detailed description of the purpose and need for the recommended improvements that were cooperatively developed are given below. Refer to Figure 3 for a depiction of the recommendations.

I-40 - Purpose and Need

- **Project Recommendation:** It is recommended that I-40 be widened to a six-lane divided facility from Iredell County to the western Mocksville Urban Planning Boundary (MUPB) and from the eastern MUPB to Forsyth County. The project limits combine for a total of approximately 18.0 miles. A portion of this project, from NC 801 into Forsyth County, is included in the 2002 - 2008 Transportation Improvement Program (TIP) as project I-911. Planning is currently in progress for this project with the purchase of right-of-way and construction scheduled for post years. The estimated cost of the TIP project is $55.9 million, as reported in the 2002 - 2008 TIP.
- **Transportation Demand:** I-40 is functionally classified as a principal arterial, primarily serving statewide and interstate travel. It is an east-west route through the central part of the

state, connecting cities such as Asheville, Morganton, Hickory, Statesville, Winston-Salem, Greensboro, Burlington, Durham, Raleigh, and Wilmington. I-40 is the only multi-lane facility that provides continuous east-west travel through the state. There are other alternate east-west routes, such as US 64 and US 74; however, they are unable to accommodate the amount of traffic carried by I-40 in a safe and efficient manner. In Davie County, I-40 serves as the primary east-west route in the central part of the county, connecting the Mocksville and Hillsdale urban areas.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on I-40 ranges from 28,200 to 40,200 vehicles per day (vpd). The current capacity of this facility is 54,000 vpd. Additionally, I-40 carries over 10 percent trucks, which further impedes the traffic flow. The 2030 projected average daily traffic of 44,300 to 73,700 vpd will result all sections I-40 in Davie County being near or over capacity. I-40 is currently operating at level of service (LOS) of C to D. (Refer to Chapter 4 for an explanation of level of service). Without any improvements, the level of service by 2030 will deteriorate to E to F, if traffic growth continues as expected. The proposed cross section, a six-lane divided facility, will provide capacity of approximately 81,000 vpd and will improve the level of service to A to B.

- **Safety Issues:** A section of I-40 is ranked among Davie County's highest crash locations. The intersection of I-40 with NC 801 is among the highest crash intersections in the county. The crashes on this section of I-40 predominately took place at night. Also, the section of I-40 in the vicinity of US 64 is rated among the highest roadway sections in the county. The crashes on this section of I-40 predominately involve vehicles running off the road. If no improvements are made to I-40, the resulting increase in congestion will result in the potential for increased accident rates. However, the recommended improvements to I-40 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **Social Demands and Economic Development:** The central and northeastern portions of Davie County, which are primarily served by I-40, have the highest growth expectations in the county, specifically in the Mocksville, Cooleemee and Hillsdale urban areas. Davie County has identified the I-40 corridor as one of their industrial growth focuses. Residential and commercial/retail development is also expected in the vicinity of I-40. The recommended improvements to I-40, in addition to accommodating the expected traffic increase, may also help spur further economic development in this area. Economic development in any portion of the county will increase the tax base, which can be used to improve public services throughout the county, thereby inducing other industries to locate in the county.

- **System Linkage:** I-40 has been designated as part of the National Highway System (NHS), which includes roadways that serve major population centers, intermodal transportation facilities, national defense, and interstate and interregional travel. The NHS comprises only 4 percent of the road network in the nation, but carries over 40 percent of total vehicle miles of travel (vmt) and 70 percent of truck traffic. I-40 is also an integral part of the National Truck Network. Because of the significance of I-40 on a statewide and national basis, it is imperative to insure the highway is kept in optimum operating condition.

- **Relationship to Other Plans:** The proposed multilane widening of I-40 extends eastward into Forsyth County as Transportation Improvement Program Project I-911.

US 601 - Purpose and Need

- **Project Recommendation:** It is recommended that US 601 be widened to a four-lane facility from SR 1414 (Ferebee Road) to I-40 and from SR 1801 (Deadmon Road) to Rowan County, for a total of approximately 10.3 miles.

- **Transportation Demand:** US 601 is functionally classified as a minor arterial, which primarily joins cities and larger towns and provides intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through traffic. It is a north-south route through the western part of the state, connecting cities such as Salisbury, Kannapolis, Concord, and Monroe. In Davie County, US 601 serves as the primary north-south route in the central part of the county, connecting Mocksville and Cooleemee.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on US 601 ranges from 3,300 to 10,100 vehicles per day (vpd). The capacity of the existing roadway is 9,000 vpd. Additionally, US 601 carries over 3 percent trucks, which further impedes the traffic flow. The 2030 projected average daily traffic of 4,700 to 16,300 vpd will result in sections of US 601 in Davie County being over capacity. US 601 is currently operating at level of service (LOS) of B to D. (Refer to Chapter 4 for an explanation of level of service). Without any improvements, the level of service by 2030 will range from C to E, if traffic growth continues as expected. The proposed cross section, a four-lane divided facility, will increase the capacity to approximately 37,700 vpd and will improve the level of service to A.

- **Safety Issues:** A section of US 601 is ranked among Davie County's highest crash locations. The intersection of US 601 with US 64 is among the highest crash intersections in the county. The accidents on this section of US 601 usually involved high severity indexes. If no improvements are made to US 601, the resulting increase in congestion will result in the potential for increased accident rates. However, the recommended improvements to US 601 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

  Due to the current lack of access control, there is a significant amount of development along several sections of US 601. Most of the development has direct driveway access to US 601, thus reducing the capacity of the facility and creating the potential for increased accident rates. This type of strip development is expected to continue to degrade the ability of the road to carry traffic safely and smoothly. Therefore, it is recommended that access control be implemented to the extent possible and that the bypass of Mocksville *(See 1992 Town of Mocksville Thoroughfare Plan)* provide some control of access. A bypass of Mocksville is more beneficial than widening existing US 601 in this area, in part due to the disruption and high cost that would be incurred in relocating businesses along the existing facility. In addition, a bypass will provide improved safety by controlling driveway access points. A bypass would provide safe, efficient travel for through traffic by separating it from the local traffic that will continue to use existing US 601.

- **Social Demands and Economic Development:** Davie County identifies the US 601 corridor as one of their industrial growth focuses. Residential and commercial/retail development is also expected in the vicinity of US 601, mainly in the Mocksville and Cooleemee urban areas. The recommended improvements to US 601, in addition to accommodating the expected traffic increase, may also help to spur further economic development in this area. Economic development in any portion of the county will increase the tax base, which can be used to improve public services throughout the county, thereby inducing other industries to locate in the county.

- **System Linkage:** Improving US 601 to a multi-lane facility is imperative because of its significance in serving intercounty travel and providing a connection between cities and larger towns. For the very same reason, it is important that the highway is kept in good operating condition. Further, US 601 plays a valuable role in providing continuous north-south travel across the county.

- **Relationship to Other Plans:** The US 64/601 Bypass is included in the 1992 Town of Mocksville Thoroughfare Plan. Four-lane widening of US 601 from Davie County extending into Rowan County is recommended in the 1981 Rowan County Thoroughfare Plan.

US 158 - Purpose and Need

- **Project Recommendation:** It is recommended that US 158 be widened to a five-lane facility from the Hillsdale Town Limits to US 801. It is also recommended that three sections of US 158 be widened to a four-lane facility. The project limits for these projects are from Forsyth County to the Hillsdale Town Limits, from NC 801 to SR 1442 (Redland Road), and from SR 1410 (Farmington Road) to the northern MUPB. These projects combine for a total length of approximately 3.5 miles.

- **Transportation Demand:** US 158 is functionally classified as a minor arterial, which primarily joins cities and larger towns and provides intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through traffic. US 158 runs east-west through the northern portion of the state, connecting cities such as Elizabeth City, Roanoke Rapids, Henderson, Reidsville, and Winston-Salem. In Davie County, US 158 serves as a north-northeast route in the eastern part of the County, connecting Hillsdale and Mocksville.

- **Roadway Capacity and Deficiencies:** The current average daily traffic on US 158 ranges from 3,900 to 10,800 vpd. The capacity of the existing roadway ranges from 9,000 (two-lane sections) to 13,500 (three-lane section) vpd. The projected average daily traffic of 7,000 to 19,800 vpd will result in portions of US 158 in Davie County being over capacity by the year 2030. US 158 is currently operating at a level of service (LOS) ranging from B to D and, without any improvements, will range from LOS C to E by the year 2030, based on traffic growth projections. The proposed cross sections, a four-lane and a five-lane facility, will provide a capacities of approximately 35,600 (five-lane) to 37,700 (four-lane) vpd and will improve the level of service to A.

- **Safety Issues:** Two sections of US 158 are ranked among Davie County's highest crash locations. The intersections of US 158 with NC 801 and SR 1442 (Farmington Road) are among the highest crash intersections in the county. The crashes on these sections of US 158 predominately involve frontal impacts. If no improvements are made to US 158, the resulting increase in congestion will result in the potential for increased accident rates. However, the recommended improvements to US 158 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **Social Demands and Economic Development:** US 158 carries traffic north-northeast through the eastern part of Davie County. Development is predominately residential along the route, with the exception of the portion within the Hillsdale urban area. The anticipated future development in this area is very substantial. Therefore, traffic will continue to increase, especially through traffic, as well as some local traffic due to the expansion of the Bermuda

Run residential development. The recommended improvements to US 158, in addition to accommodating the expected traffic increase, may also help to spur additional economic development.

- **System Linkage:** Improving US 158 to a multi-lane facility is imperative because of its significance in serving intercounty travel and providing a connection between cities and larger towns. Further, US 158 plays an extremely crucial role in providing continuous north-northeast travel across the county, connecting Mocksville and Hillsdale to the Winston-Salem urban area.

- **Relationship to Other Plans:** The multilane widening of US 158 continues into Forsyth County and is documented in the 1989 Winston-Salem / Forsyth County Thoroughfare Plan.

US 64 - Purpose and Need

- **Project Recommendation:** It is recommended that US 64 be widened to a four-lane facility from Iredell County to the western MUPB and from the eastern MUPB to Davidson County. The project limits combine for a total of approximately 9.7 miles. A portion of this project, from the eastern MUPB to Davidson County, is included in the 2002 - 2008 Transportation Improvement Program (TIP) as project R-3602. This project is currently unfunded. The purchase of right-of-way and construction for this project are scheduled for post years. The estimated cost of the TIP project is $95.2 million, as reported in the 2002 - 2008 TIP.
  It is recommended that partial control of access be implemented to the extent possible.

- **Transportation Demand:** US 64, from Iredell County to the western MUPB, is functionally classified as a major collector, which primarily serves intracounty travel and traffic generators in addition to providing access to the arterial system. US 64, from the eastern MUPB to Davidson County, is functionally classified as a minor arterial, which primarily joins cities and larger towns and provides intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through traffic. US 64 runs east-west through the central portion of the state, connecting cities such as Rocky Mount, Raleigh, Asheboro, Lexington, Statesville, Lenoir, and Morganton. In Davie County, US 64 serves as a east-west route in the central part of the county, connecting Mocksville with Statesville to the west and Lexington to the east.

- **Roadway Capacity and Deficiencies:** The current average daily traffic on US 64 ranges from 2,800 to 8,000 vpd. The capacity of the existing roadway is 9,000 vpd. The projected average daily traffic of 8,100 to 13,900 vpd will result in portions of US 64 in Davie County being over capacity by the year 2030. US 64 is currently operating at level of service (LOS) B to C and, without any improvements, will be operating at LOS C to E by the year 2030, based on traffic growth projections. The proposed cross section, a four-lane divided facility, will provide capacity of approximately 37,700 vpd and will improve the level of service to A.

- **Safety Issues:** A section of US 64 is ranked among Davie County's highest crash locations. The intersection of US 64 with US 601 is among the highest crash intersections in the county. The accidents on this section of US 64 usually involved high severity indexes. If no improvements are made to US 64, increasing traffic congestion will result in the potential for increased accident rates. However, the recommended improvements to US 64 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

Due to the current lack of access control, there is a significant amount of development along several sections of US 64. Most of the development has direct driveway access to US 64, thus reducing the capacity of the facility and creating the potential for increased accident rates. This type of strip development is expected to continue to degrade the ability of the road to carry traffic safely and smoothly. Therefore, it is recommended that access control be implemented to the extent possible and that the bypass of Mocksville *(See 1992 Town of Mocksville Thoroughfare Plan)* provide some control of access. A bypass of Mocksville is more beneficial than widening existing US 64 in this area, in part due to the disruption and high cost that would be incurred in relocating businesses along the facility. In addition, a bypass will provide improved safety by controlling driveway access points. A bypass would provide safe, efficient travel for through traffic by separating it from the local traffic that will continue to use existing US 64.

- **Social Demands and Economic Development:** US 64 carries traffic east-west through the Town of Mocksville, located in the central part of Davie County. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. The anticipated future development in this area is very substantial. Therefore, traffic will continue to increase, especially through traffic, as well as some local traffic. The recommended improvements to US 64, in addition to accommodating the expected traffic increase, may also help to spur economic development.

- **System Linkage:** Because of the significance of US 64 in serving intracounty and intercounty travel and providing a connection between cities and larger towns, it is important that the highway is kept in good operating condition. Further, US 64 plays an extremely crucial role in providing continuous east-west travel across the county, connecting Mocksville to larger cities such as Statesville and Lexington.

- **Relationship to Other Plans:** The multilane widening of US 64 continues into Davidson County as TIP project R-3602, which is currently unfunded. These improvements to US 64 can be found in the 1984 Davidson County Thoroughfare Plan. The US 64/601 Bypass is included in the 1992 Town of Mocksville Thoroughfare Plan.

NC 801 - Purpose and Need

- **Project Recommendation:** It is recommended that NC 801 be widened to a four-lane facility from SR 1410 (Farmington Road) to SR 1624 (Old NC 801). The project limits combine for a total of approximately 2.7 miles. A portion of this project, US 158 to SR 1624, is included in the 2002 - 2008 Transportation Improvement Program (TIP) as project R-3610. This project is currently unfunded. The purchase of right-of-way and construction for this project are scheduled for post years. The estimated cost of the TIP project is $17.8 million, as reported in the 2002 - 2008 TIP. It is recommended that partial control of access be implemented to the extent possible.

- **Transportation Demand:** NC 801 is functionally classified as a major collector, which primarily serves intracounty travel and traffic generators in addition to providing access to the arterial system. NC 801 runs through the central portion of the state from Farmington, North Carolina near US 601 to NC 150, near Mooresville, North Carolina. In Davie County, NC 801 serves as a north-south route in the eastern part of the county, from Rowan County to US 601 near Yadkin County.

- **Roadway Capacity and Deficiencies:** The current average daily traffic on this section of NC 801 ranges from 5,500 to 11,300 vpd. The capacity of the existing roadway is 9,300 vpd. The projected average daily traffic of 10,100 to 23,000 vpd will result in this portion of NC 801 in Davie County being over capacity by the year 2030. This portion of NC 801 is currently operating at level of service (LOS) C to D and, without any improvements, will be at LOS D to F by the year 2030, based on traffic growth projections. The proposed cross section, a four-lane facility, will provide a capacity of approximately 37,700 vpd and will improve the level of service to A.

- **Safety Issues:** Two sections of NC 801 are ranked among Davie County's highest crash locations. The intersections of NC 801 with US 158 and I-40 are among the highest crash intersections in the county. The crashes on these sections of NC 801 predominately involve frontal impacts and night crashes. If no improvements are made to NC 801, the resulting increase in congestion will result in the potential for increased accident rates. However, the recommended improvements to NC 801 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **Social Demands and Economic Development:** NC 801 carries traffic north-south through the eastern part of Davie County. Development is currently rural along the route, with the exception of the portion within the Hillsdale urban area. The anticipated future development in this area is very substantial due to the continuing growth of the Bermuda Run residential development. Therefore, traffic along this route will continue to increase. The recommended improvements to NC 801, in addition to accommodating the expected traffic increase, may also help to spur additional economic development.

- **System Linkage:** Because of the significance of NC 801 in serving intracounty travel, it is important that the highway is kept in good operating condition. Further, NC 801 plays an extremely crucial role in providing continuous north-south travel across the county.

- **Relationship to Other Plans:** The thoroughfare plans of surrounding counties do not make any recommendations for NC 801.

SR 1410 (Farmington Road) - Purpose and Need

- **Project Recommendation:** It is recommended that SR 1410 (Farmington Road) be widened to a four-lane facility from NC 801 to US 158, for a total length of 4.6 miles. This can be accomplished in two phases. Phase 1 should include the section from US 158 to SR 1437 (Pinebrook Drive). Phase 2 would encompass the remainder of the project from SR 1437 (Pinebrook Drive) to NC 801.

- **Transportation Demand:** SR 1410 is functionally classified as a minor collector, which primarily serves small local communities and traffic generators providing access to the major collector system. In Davie County, SR 1410 serves as a north-south route in the northern part of the county, from Yadkin County to US 158. This route also serves as a direct connection between NC 801, I-40, and US 158.

- **Roadway Capacity and Deficiencies:** The current average daily traffic on SR 1410 is 4,900 vpd. The capacity of the existing roadway is 9,700 vpd. The projected average daily traffic of 8,900 vpd will result in SR 1410 being near capacity by the year 2030. SR 1410 is currently

operating at level of service (LOS) B and, without any improvements will be at LOS D by the year 2030, based on traffic growth projections. The proposed cross section, a four-lane facility, will provide a capacity of approximately 37,700 vpd and will improve the level of service to A.

- **Safety Issues:** A section of SR 1410 is ranked among Davie County's highest crash locations. The intersection of SR 1410 with US 158 is among the highest crash intersections in the county. The accidents on this section of SR 1410 usually involve frontal impact crashes. If no improvements are made to SR 1410, increasing traffic congestion will result in the potential for increased accident rates. However, the recommended improvements to SR 1410 will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **Social Demands and Economic Development:** SR 1410 carries traffic north-south through the northern part of Davie County. Development is currently rural along the route. The anticipated future development in this area is moderate. However, traffic will continue to increase since many motorists consider this an optimal route when accessing NC 801, I-40, and US 158. The recommended improvements to SR 1410, in addition to accommodating the expected traffic increase, may also help to spur economic development.

- **System Linkage:** Because of the significance of SR 1410 in serving small local communities and traffic generators, it is important that the highway is kept in good operating condition. Further, SR 1410 plays an extremely crucial role in providing continuous north-south travel across the county.

- **Relationship to Other Plans:** This facility is not directly related to any other thoroughfare plan.

Widening Projects

The following projects are recommended to be widened to improve safety and capacity. Each of the sections of roadway listed below currently has lane widths less than 12 feet and, based on the volume of traffic on the road, are recommended to be widened. Before any roadway improvements are made, especially to roads that are part of the NC Bike Route system, the NCDOT Division of Bicycle and Pedestrian Transportation should be consulted on the most appropriate cross section.

- **SR 1139 (Jericho Road):** It is recommended that SR 1139 be widened from two 9-foot lanes to two 12-foot lanes from SR 1147 (Davie Academy Road) to SR 1121 (Gladstone Road).

- **SR 1143 (Davie Academy Road):** It is recommended that SR 1143 be widened from two 9-foot lanes to two 12-foot lanes from US 64 to I-40.

- **SR 1801 (Deadmon Road):** It is recommended that SR 1801 be widened from two 9-foot lanes to two 12-foot lanes from US 601 to NC 801.

- **SR 1802 (Turrentine Road):** It is recommended that SR 1802 be widened from two 10-foot lanes to two 12-foot lanes from NC 801 to the end of state maintenance.

Intersection Improvements

The following intersections are recommended for safety improvements.

- **SR 1611 (Fork Bixby Road) / SR 1630 (Baltimore Road)**

  Realign roadways at the intersection of SR 1611 (Fork Bixby Road) and SR 1630 (Baltimore Road) to eliminate offsetting intersection condition. This improvement will form a single intersection with continuous through movement. Additionally, the rail crossing on SR 1611 (Fork Bixby Road) just south of SR 1616 (Cornatzer Road) should be upgraded to improve safety. These improvements will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **SR 1632 (Junie Beauchamp Road) / US 158**

  Realign roadways at the intersection of SR 1632 (Junie Beauchamp Road) and US 158 to eliminate offsetting intersection condition. This improvement will form a single intersection with continuous through movement. Additionally, SR 1632 (Beauchamp Road) should be upgraded to 2-12' lanes and the roadway realigned to improve horizontal deficiencies. These improvements will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

- **NC 801 / US 158**

  Addition of a dedicated right turn lane on NC 801 North at the intersection of US 158 with increased stack room to accommodate traffic turning onto US 158 East.

  Increased stack room for the dedicated left turn lane on NC 801 North turning onto US 158 West.

  Addition of a dedicated right turn lane on US 158 West turning onto NC 801 North.

  These improvements will provide increased capacity, greater maneuverability, and more control of access, resulting in safer driving conditions.

Bicycle Routes

Davie County currently does not have any designated bicycle routes.

When considering the widening of facilities with dedicated bicycle routes, the NCDOT Division of Bicycle and Pedestrian Transportation should be consulted. This division can recommend the most appropriate cross section for the widening, in addition to providing assistance in identifying the need for improvements based on present and future bicycle traffic. For further consideration and assistance, the coordinator of this division can be contacted at the address below.

NC Department of Transportation
Division of Bicycle and Pedestrian Transportation

1552 Mail Service Center
Raleigh, 27699-1552

Public Involvement

Based on a request from the Davie County Planning Director in September of 1999, the study to develop a thoroughfare plan for Davie County was officially started in June of 2000. NCDOT officials met with the Davie County Planning Director on October 10, 2000. This meeting was held to present information on the thoroughfare planning process and to gather input on the transportation needs of the county. A goals and objectives survey was developed by the Davie County Planning Department and randomly distributed throughout the county (See Appendix H). On January 30, 2001, NCDOT representatives met with the Davie County Planning Board to develop preliminary recommendations for the thoroughfare plan. Planning Board members requested additional time to review the recommendations, and a special planning session was scheduled for March 27, 2001. During the special planning session, the results from the goals and objectives survey were reviewed and recommendations were developed. Results and comments from this session were forwarded to the Statewide Planning Branch. These comments and suggestions were evaluated and incorporated accordingly. A revised set of thoroughfare plan recommendations was presented to the planning board on June 26, 2001. With the planning board's approval, these recommendations were finalized in August of 2001. Public information sessions were scheduled throughout the county. On September 14, September 20, and October 22, 2001, planning sessions were held in the Towns of Bermuda Run, Mocksville, and Cooleemee, respectively. The results of these sessions yielded positive comments, which were incorporated into the plan. Final recommendations were presented to the planning board on November 27, 2001. The planning board approved the recommendations and referred the plan to the County Commissioners for a public hearing and adoption. On December 17, 2001, the proposed thoroughfare plan was presented at the County Commissioners' meeting, with members of the public present. After a public hearing, the County Commissioners decided to table a vote on the Davie County Thoroughfare Plan to allow further review. Following two additional work sessions held by the Davie County Commissioners, the Davie County Thoroughfare Plan was adopted on August 19, 2002. The thoroughfare plan was adopted by the North Carolina Board of Transportation on November 7, 2002.

Chapter 3
Implementation of the Thoroughfare Plan

Once the thoroughfare plan has been developed and adopted, implementation is one of the most important aspects of the transportation plan. Unless implementation is an integral part of this process, the effort and expense associated with developing the plan will be lost. There are several tools available for use by the County to assist in the implementation of the thoroughfare plan. They are described in detail in this chapter.

State-County Adoption of the Thoroughfare Plan

Davie County and the North Carolina Department of Transportation (NCDOT) have mutually approved the thoroughfare plan shown in Figure 2. The mutually adopted plan now serves as a guide for the NCDOT in the development of the transportation system for the county. The approval of this plan by the County also enables standard road regulations and land use controls to be used effectively in the implementation of this plan.

Subdivision Controls

Subdivision regulations require every subdivider to submit to the County Planning Board a plan of any proposed subdivision. It also requires that subdivisions be constructed to meet certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect necessary right-of-way for proposed roads. The construction of subdivision streets to adequate standards reduces maintenance costs and simplifies the transfer of streets to the State Highway System. Appendix D outlines the recommended subdivision design standards as they pertain to road construction.

Land Use Controls

Land use regulations are an important tool in that they regulate future land development and minimize undesirable development along roadways. The land use regulatory system can improve highway safety by requiring sufficient setbacks to provide for adequate sight distances and by requiring off-street parking.

Development Reviews

The District Engineer's Office and the Traffic Engineering Branch of NCDOT review driveway access to any state-maintained road. In addition, any development expected to generate large volumes of traffic (e.g., shopping centers, fast food restaurants, or large industries) should be comprehensively studied by the Traffic Engineering Branch, the Project Development and Environmental Analysis Branch, and/or the Roadway Design Unit of NCDOT. If reviewed at an

early stage, it is often possible to significantly improve the development's accessibility while preserving the integrity of the thoroughfare plan.

Funding Sources

County Construction Account

The County Construction Account is used to allocate funding to pave unimproved roads, widen roadways, stabilize dirt roads, make minor alignment improvements, and even construct short connectors when appropriate. These improvements are implemented on a priority basis that is developed through the NCDOT Division Offices. The appropriate Division Engineer's Office should be contacted for more information on the County Construction Account. The office address for Division Nine, which includes Davie County, is given below. For more specific contact information for the Division Office or any other NCDOT personnel, the Customer Service Office can be contacted toll free at 1-877-DOT-4YOU or by visiting the website at www.ncdot.org.

Division Engineer's Office (Division 9)
N.C. Department of Transportation
2125 Cloverdale Avenue
Winston-Salem, NC 27103
(336) 761-2200

Transportation Improvement Program

North Carolina's Transportation Improvement Program (TIP) is a document that lists all major transportation projects, and their funding sources, planned by the NCDOT for a seven-year period. Every two years, when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added. In addition to highway construction and widening, TIP funds are available for bridge replacement, highway safety projects, enhancement projects, environmental mitigation, railroad crossings, bicycle facilities, and public transportation.

During biannual TIP public hearings, Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), municipalities, local citizens groups, and other interested parties request projects to be included in the TIP. The group requesting a particular project(s) should submit to the NCDOT Board of Transportation Member from the county's respective division the following: a letter with a prioritized summary of requested projects, TIP candidate project request forms, and project location maps with a description of each project. Refer to Appendix F for an example of a TIP project request packet. The Board of Transportation reviews all of the project requests from each area of the state. Based on the technical feasibility, need, and available funding, the board decides which projects will be included in the TIP.

Industrial Access Funds

If certain economic conditions are met, Industrial Access Funds are available for construction of access roads for industries that plan to develop property that does not have access to any state-

maintained road. The NCDOT Secondary Roads Office should be contacted for information on Industrial Access Funds.

Small Urban Funds

Small Urban Funds are annual discretionary funds that are distributed to municipalities for qualifying projects. A given municipality may receive funding for multiple projects, but there is a maximum of one million dollars per year per division. Requests for Small Urban Fund assistance should be directed to the Division Engineer.

The North Carolina Highway Trust Fund Law

The Highway Trust Fund Law was established in 1989 as a plan with four major goals for North Carolina's roads and highways. These goals are:

1. To complete the remaining 1,716 miles of four lane construction on the 3,600 mile North Carolina Intrastate System.

2. To construct a multilane connector in Asheville and portions of multilane loops in Charlotte, Durham, Greensboro, Raleigh, Wilmington, and Winston-Salem.

3. To supplement the secondary roads appropriation in order to pave, by 1999, 10,000 miles of unpaved secondary roads carrying 50 or more vehicles per day, and all other unpaved secondary roads by 2006.

4. To supplement the Powell Bill Program.

A portion of this bill, which will benefit Davie County over the thirty-year planning period, is the paving of most, if not all, of its unpaved roads on the state-maintained system. The Program Development Branch of NCDOT should be contacted for information on the Highway Trust Fund Law.

Implementation Recommendations

The Table 1 gives recommendations for the most suitable funding sources and methods of implementation for the major project proposals of the Davie County Thoroughfare Plan.

Table 1

Funding Sources and Recommended Methods of Implementation

Projects	Funding Sources				Methods of Implementation			
	Local Funds	TIP Funds	Indust. Access	Small Urban	T-fare Plan	Subdiv. Ord.	Zoning Ord.	Develop. Review
I-40 (TIP #I-911)		X			X		X	
I-40 Widening		X			X		X	
US 601 Widening		X			X		X	X
US 158 Widening		X			X		X	X
US 64 (TIP #R-3602)		X			X		X	X
US 64 Widening		X			X		X	X
NC 801 (TIP #R-3610)		X			X		X	X
NC 801 Widening		X			X		X	X
SR 1410 Widening		X			X		X	X
SR 1611 / SR 1630		X		X	X		X	
SR 1632 / US 158				X	X		X	
NC 801 Turn Lanes				X	X		X	
US 158 Turn Lane				X	X		X	

Chapter 4
Analysis of Davie County's Roadway System

This chapter presents an analysis of the ability of the existing roadway system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but also on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be a system deficiency such as a need for a bypass, loop facility, construction of missing links, or additional radials.

Analysis of the roadway system involves examination of the existing travel patterns and identification of existing deficiencies. Roadway capacity and safety analyses are also essential in evaluating the existing transportation system. After a picture of the existing travel conditions has been developed, factors that will impact the future transportation system must be analyzed. These factors include projected population growth, economic development potential, and land use trends. This information is used to determine anticipated future deficiencies in the transportation system.

Current Transportation Plans for Davie County

Thoroughfare Plans

A thoroughfare plan is a tool to aid officials in the development of an appropriate transportation system. It is important that the communities within a county and county officials cooperate in the development of their transportation system. Thoroughfare plan development and implementation, jointly undertaken, will help ensure the development of an efficient system for travel throughout the county. The following thoroughfare planning studies have previously been done for Davie County:

1. Mocksville, plan adopted in 1992

Transportation Improvement Program Projects

The Transportation Improvement Program (TIP) is a seven-year project planning document that lists the major transportation improvement projects planned by the North Carolina Department of Transportation (NCDOT). In addition to roadway projects, the TIP includes funding for bridge replacement, highway safety projects, enhancement projects, environmental mitigation, railroad crossings, bicycle facilities, and public transportation. Listed below are projects identified in the 2002 – 2008 TIP for Davie County.

1. **I-40**

   I-911: West of NC 801 (Exit 180) to west of SR 1122. Pavement rehabilitation and construct fifth and sixth lanes.

   *I-2804: SR 2166 in Iredell County to east of SR 1143 in Davie County. Pavement and bridge rehabilitation.

   I-3600: SR 1436 (Mile Post 175) to south of NC 801 (Mile Post 180). Pavement rehabilitation.

   I-4006: SR 2167 in Iredell County to 0.5 miles west of NC 801. Install median guardrail.

   K-3401: Renovation of buildings and grounds for pair of rest areas. Buildings to include dual restrooms and ADA compliant single restroom.

2. **US 601**

   SI-4413: US 601 and Madison Road. Install traffic signal.

3. **US 64**

   R-3111: US 64 east of Mocksville to US 601 west of Mocksville. Two lane bypass of Mocksville on four lane right of way, new location.

   *R-3602: US 601 south of Mocksville to US 52 in Lexington. Widen to multi-lanes and upgrade interchange at US 52.

4. **NC 801**

   *R-3610: SR 1650 at Advance to US 158 south of I-40. Upgrade roadway from SR 1650 to SR 1624, multi-lane roadway from SR 1624 to US 158.

5. **Bridge Projects**

   B-3835: Yadkin River. US 158 – Replace bridge #35.

   B-3637: I-40. NC 801 – Replace bridge #37.

   B-4104: Carter Creek. NC 801 – Replace bridge #21.

   B-4256: South Yadkin River. NC 801 – Replace bridge #80.

   B-3161: Bear Creek. SR 1139 – Replace bridge #11.

* Project listed in TIP, but no funds have been assigned.

Existing Travel Patterns and Deficiencies

Traffic Demand

For the purposes of a thoroughfare plan study, roads that are functionally classified are principally the ones studied. Appendix A provides an explanation of functional classification and Figure A-2 depicts Davie County Functional Classification. Travel demand on these facilities is measured in the form of average daily traffic counts. Traffic counts are periodically taken by the NCDOT throughout the state, including several locations in Davie County. The 2000 average daily traffic (ADT) for Davie County's functionally classified roads is shown in Figure 5 and listed in Appendix B, Table B-1.

Width and Alignment Deficiencies

NCDOT's roadway design standards establish criteria for minimum pavement widths, dependent on the type of facility, the design speed, and the current and design year ADT. These criteria call for 12-foot lanes for all highways with design speeds greater than 50 miles per hour (mph) and design year ADT greater than 2,000 vehicles per day (vpd). However, roads with lower speeds and ADT are designed with lane widths as narrow as 10 feet. In addition to criteria for designing new facilities, there are standards for minimum tolerable lane widths on existing roads. These minimum tolerable lane widths are summarized below in Table 2.

Table 2

Minimum Tolerable Lane Widths

Average Daily Traffic (vpd)	Principle Arterials (ft)	Minor Arterials (ft)	Collectors (ft)
Over 2000	11	11	11
400 - 2000		10	10
100 - 400		10	9
Below 100			9

There are a number of roads in Davie County that have substandard widths. Due to the substantial cost of upgrading all secondary roads to standard 12-foot lanes, narrower widths may have to be tolerated until sufficient funds are available for improvements. The roads identified as part of the Davie County's Thoroughfare Plan study that have substandard widths and, based on the volume of traffic on the road, are recommended to be widened to 12-foot lanes are shown in Figure 9 and are listed below.

- SR 1139 (Jericho Road): From SR 1147 (Davie Academy Road) to SR 1121 (Gladstone Road)
- SR 1143 (Davie Academy Road): From US 64 to I-40
- SR 1801 (Deadmon Road): From US 601 to NC 801
- SR 1802 (Turrentine Road): From NC 801 to the End of State Maintenance

Capacity Analysis of the Existing System

The adequacy of the existing roadway system is evaluated by comparison of traffic volumes to the ability of the roads to move traffic freely at a desirable speed. The ability of a facility to move traffic freely, safely, and efficiently with minimum delay is controlled primarily by the type and spacing of traffic control measures. Thus, the ability of a road to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by applying other traffic engineering strategies.

Capacity is the maximum number of vehicles which have a "reasonable expectation" of passing over a given section of roadway, during a given time period under prevailing roadway and traffic conditions. Roadway capacities and 2000 average daily traffic for facilities in Davie County are shown in Figure 5 and listed in Appendix B, Table B-1. Currently, the following facilities in Davie County are over capacity:

- US 601: From the southern MUPB to US 801
- US 158: From Forsyth County to the Hillsdale Town Limits and from US 801 to SR 1442 (Redland Road)
- NC 801: From I-40 to SR 1661 (Overlook Drive)

Additionally, the following facility in Davie County is nearing capacity:

- US 64: From US 801 to Davidson County

The relationship of traffic volumes to the capacity of the road determines the level of service (LOS) provided. Six levels of service have been defined, with letter designations from A to F. LOS A represents the best operating conditions and LOS F represents the worst.

The definitions of levels of service are general and conceptual in nature. Levels of service for interrupted flow, or signalized, facilities vary widely in terms of both the users perception of service quality and the operational variables used to describe them. The 1995 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type. The six levels of service, whose definitions follow, are illustrated in Figure 4.

Levels of Service

LOS A

Describes primarily free flow conditions. Motorists experience high levels of physical and psychological comfort. The effects of minor incidents of breakdown are easily absorbed. Even at the maximum density, the average spacing between vehicles is about 528 feet, or 26 car lengths.

LOS B

Represents reasonably free flow conditions. The ability to maneuver within the traffic stream is only slightly restricted. The lowest average spacing between vehicles is about 330 feet, or 18 car lengths.

LOS C

Provides for stable operations, but flows approach the range in which small increases will cause substantial deterioration in service. Freedom to maneuver is noticeably restricted. Minor incidents may still be absorbed, but the local decline in service will be great. Queues may be expected to form behind any significant blockage. Minimum average spacings are in the range of 220 feet, or 11 car lengths.

LOS D

Borders on unstable flow. Density begins to deteriorate somewhat more quickly with increasing flow. Small increases in flow can cause substantial deterioration in service. Freedom to maneuver is severely limited, and drivers experience drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. At the limit, vehicles are spaced at about 165 feet, or 9 car lengths.

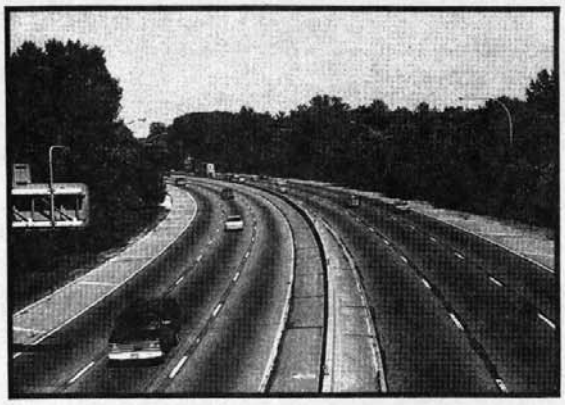
LOS E

Describes operation at capacity. Operations at this level are extremely unstable, because there are virtually no usable gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This establishes a disruption wave that propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing. Vehicles are spaced at approximately 6 car lengths, leaving little room to maneuver.

LOS F

Describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.

Source: 1994 Highway Capacity Manual



LOS A.

LOS D.

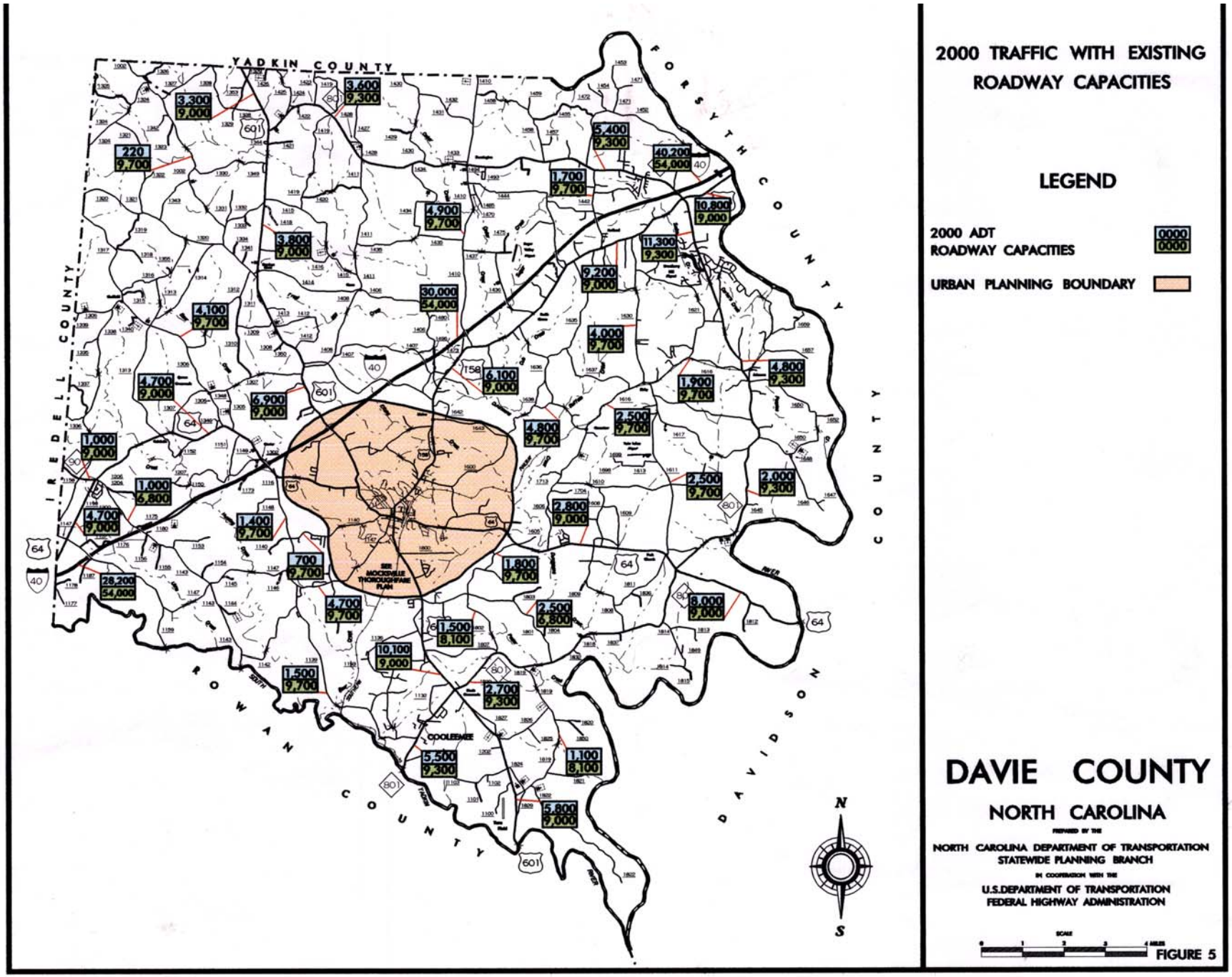
LOS B.

LOS E.

LOS C.

LOS F.

LEVELS OF SERVICE **FIGURE 4**


2000 TRAFFIC WITH EXISTING ROADWAY CAPACITIES
LEGEND
2000 ADT ROADWAY CAPACITIES
0000 0000
URBAN PLANNING BOUNDARY
DAVIE COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
FIGURE 5
YADKIN COUNTY
IREDELL COUNTY
FORSYTH COUNTY
DAVIDSON COUNTY
ROWAN COUNTY
COOLEEMEE
N
S

Traffic Crashes

Traffic crash statistics can often be used as an indicator for locating congestion problems. Traffic crash records can also be reviewed to identify problem locations or deficiencies such as substandard design, inadequate signing, ineffective parking, or poor sight distance. Crash patterns identified from analysis of crash data can lead to improvements that will reduce the number of crashes.

The NCDOT Traffic Engineering and Safety Systems Branch periodically reviews crash data statewide to identify areas where crash rates may be reduced as a result of roadway improvements. The Highway Safety Improvement Program identifies the highest crash intersections so that they may be studied further. To be included in the program, each location must meet one of several warrants, or minimum criteria. For intersections, the categories of warrants are front impact crash rate (Warrant I-1), previous year crash rate (Warrant I-2), severity index levels (Warrant I-3), night crash rate without streetlights (Warrant I-4), and chronic intersection locations (Warrant I-5).

Intersection Warrants	Types of Crashes
Warrant I-1 (Frontal Impact)	Angle Left / Right Turn Same Road Left / Right Turn Different Road Head On
Warrant I-2 (Last Year Crashes)	Previous year crash rate
Warrant I-3 (Frequency with a Severity Index Minimum)	Severity index levels
Warrant I-4 (Night Crashed Without Streetlights)	Night crashes
Warrant I-5 (Chronic Intersection Locations)	Rear End Crashes Run Off Road Crashes Crossing Pattern Crashes Right Turn Other Modes (Includes pedestrian, bicycle, moped crashes)

In addition to intersections, roadway sections are also evaluated for high crash frequency. Like intersections, these sections of roadway must meet one of several warrants, or minimum criteria to be included in the Highway Safety Improvement Program. These warrants are given below.

Section Warrants	Types of Crashes
Warrant S-1	Run off road during wet condition crashes
Warrant S-2	Run off road crashes
Warrant S-3	Wet condition crashes
Warrant S-4	Non-Intersection night crashes without streetlights

Crash data is given by type in order to identify any trends that may be correctable through roadway or intersection improvements. The total number of crashes and the average crash severity are useful for ranking the most problematic intersections. The severity index is based on a series of weighting factors developed by the NCDOT. These factors define a fatal or incapacitating crash as 47.7 times more severe than one involving only property damage, and an crash resulting in minor injury as 11.8 times more severe than one with only property damage. In general, a higher severity index indicates more severe crashes. Listed below are levels of severity for various severity index ranges.

Severity	Severity Index
low	< 6.0
average	6.0 to 7.0
moderate	7.0 to 14.0
high	14.0 to 20.0
very high	> 20.0

Table 3 gives a summary of the intersections in Davie County with the highest crash rates. For each intersection, the total number of crashes is given by type and by average severity index. The criterion used to identify these locations includes all crashes within 150 feet of an intersection over a three-year period, between January 1997 and December 1999.

Table 4 gives a summary of the roadway sections in Davie County with the highest crash rates. These sections of roadway are evaluated over the same period of time and include crashes that do not occur within 200 feet of an intersection.

To request a more detailed crash analysis for any of the intersections given in Table 3, or other intersections of concern, the appropriate Area Traffic Engineer, which is Area 4 for Davie County, should be contacted.

Area 4 (Serves Divisions 9, 10, and 11)
Area Traffic Engineer
8007-D North Point Blvd.
Winston-Salem, NC 27106
(336) 896-7037

Table 3

Davie County Highest Crash Intersections

Location Number	Intersection	I-1	I-2	I-3	I-4	I-5	Other	Total	Severity Index
1	US 158 / NC 801*	21					9	30	11.05
2	I-40 / NC 801*		17		10		1	28	9.59
3	US 158 / SR 1442	10						10	-
4	US 64 / US 601*			17				17	1.43

Note: * Denotes intersection is included in the 2000 Spring Highway Safety Improvement Program.

Table 4

Davie County Highest Crash Roadway Sections

Location Number	Intersection	S-1	S-2	S-3	S-4	Total	Severity Index
1	I-40 in the vicinity of US 64*	21	33			54	14.68

Note: * Denotes section is included in the 2000 Spring Highway Safety Improvement Program.

Existing Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most importantly, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the system of which they are a part.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that "all structures designed as bridges located on any of the Federal-Aid Highway Systems be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years." The NCDOT Bridge Maintenance Unit, with assistance from various consultants, inspects all bridges on the State Highway System.

The Transportation Improvement Program (TIP) development process for bridge projects involves consideration of several evaluation methods in order to prioritize needed improvements. A sufficiency index is used to determine whether a bridge is sufficient to remain in service, or to what extent it is deficient. The index is a percentage in which 100 percent represents an entirely sufficient bridge and zero represents an entirely insufficient or deficient bridge. Factors evaluated in calculating the index are listed below.

- structural adequacy and safety
- serviceability and functional obsolescence
- essentiality for public use
- type of structure
- traffic safety features

A bridge is considered deficient if it is either structurally deficient or functionally obsolete. Bridges in the functionally obsolete category have below average ratings in approach roadway alignment, under clearance, deck geometry, waterway adequacy, or structural condition. Structurally deficient bridges have below average ratings in deck superstructure, substructure, overall structural conditions, or waterway adequacy. A bridge must be classified as deficient before it is eligible for Federal Bridge Replacement Funds. The sufficiency rating must be less than 50 to qualify for replacement or less than 80 to qualify for rehabilitation under federal funding.

In addition to the sufficiency index, further analysis is performed using the Level of Service Analysis and Prioritization (LOSAP) program. This program ranks bridges by deficiency points, which are calculated based on maintaining desired levels of service. The levels of service for lane and shoulder width, vertical clearance, and load capacity vary with roadway functional classification and average daily traffic. Another tool for prioritizing bridge improvements is the Optimum Bridge Budget Forecasting and Allocation System (OPBRIDGE). This program determines the optimum improvement action and time for each bridge in a network given certain level of service goals and funding constraints.

The output from each of these evaluation methods, along with input from NCDOT Bridge Maintenance personnel and local communities, is used to prioritize bridge projects. Bridges with the highest priority are replaced as federal and state funds become available.

All bridges in Davie County have been analyzed, rated, and inventoried. Table 5 shows the all functionally obsolete bridges and Table 6 shows the fifteen most structurally deficient bridges in the county.

Table 5

Functionally Obsolete Bridges in Davie County

Bridge No.	Facility Carried	Water Source	Location	Rating
9	US 601	SOUTHERN RAILROAD	100 FT. N. JCT. SR 1800	69.6
20	US 601	I-40	0.1 MI. N. JCT. SR 1301	80.0
34	US 64	BEAR CREEK	0.5 MI. E. JCT. SR 1116	58.1
36	US 601	DUTCHMAN'S CREEK	0.6 MI. S. JCT. NC801	74.5
84	FARM ROAD	I-40	1.1 MI. E. JCT. NC 801	48.1
107	SR 1606	ELLSWORTH CREEK	0.3 MI. N. JCT. US 64	73.6

Table 6

Fifteen Most Structurally Deficient Bridges in Davie County

Bridge No.	Facility Carried	Water Source	Location	Rating
11*	SR 1147	BEAR CREEK	0.8 MI. N. JCT. SR 1160	17.9
21*	NC 801	CARTER CREEK	0.8 MI. S. JCT. SR 1645	31.9
35*	US 158	YADKIN RIVER	1.4 MI. E. JCT. NC 801	40.6
37*	NC 801	I-40	0.2 MI. N. JCT. US 158	41.5
57	SR 1420	DUTCHMANS CREEK	0.7 MI. E. JCT. SR 1419	28.5
60	SR 1802	PEELER CREEK	0.4 MI. N. JCT. NC 801	22.7
77	SR 1321	DUTCHMANS CREEK	1.1 MI. S. JCT. SR 1324	53.8
85	I-40 EBL	YADKIN RIVER	1.3 MI. E. JCT. NC 801	61.8
86	I-40 WBL	YADKIN RIVER	1.3 MI. E. JCT. NC 801	61.8
112	SR 1624	CARTERS CREEK	0.3 MI. S. JCT. SR 1656	43.3

Notes: * Denotes the bridge is in the current Transportation Improvement Program.

Factors Affecting the Future Roadway System

The objective of thoroughfare planning is to develop a transportation system that will meet future travel demand and enable people and goods to travel safely and efficiently. To determine the needs of an area it is important to understand the effect of population, economics and land use on the roadway system. Examination of these factors helps to explain historic travel patterns and lays the groundwork for thoroughfare planning.

Population

The amount of traffic on a section of roadway is a function of the size and location of the population that it serves. Investigating past trends in population growth and projecting future population growth and dispersion is an essential step in transportation planning. Table 7 shows the historical trends and projected population for Davie County through the year 2030. Table 8 shows population trends by township.

Table 7

Davie County Population Trends and Projections

Year	Population	Percent Growth
1970	18,855	-
1980	24,599	+30.5
1990	27,859	+13.3
2000	34,835	+25.0
2010	41,932[a]	+20.0
2020	48,979[a]	+16.8
2030	56,157[a]	+14.7

Note: a - Source: State Agency Data: Office of the Governor

Table 8

Davie County Population by Township				
Township	1970	1980	1990	1980 – 1990
Calahaln	1,210	1,643	1,861	+218 / 13.3%
Clarksville	1,634	2,127	2,429	+302 / 14.2%
Farmington	3,319	6,236	7,990	+1754 / 28.1%
Fulton	1,307	1,713	1,697	-16 / -0.9%
Jerusalem	4,220	4,275	4,636	+361 / 8.4%
Mocksville	5,702	6,825	7,014	+189 / 2.8%
Shady Grove	1,463	1,780	2,232	+452 / 25.4%

Economy and Employment

Another important factor to be considered in estimating the future traffic growth of an area is its economic base. The number of employers and the average per capita income, or purchasing power, influences how much population can be supported in an area and the number of motor vehicles that will be locally owned and operated. Generally, as family income increases so does the number of vehicles owned, as well as the number of vehicles trips generated per day by each household. An accurate projection of the future economy of an area is essential in estimating future travel demand.

Factors that will influence economic growth and development in Davie County over the thirty-year planning period include the expansion of the Mocksville, Cooleemee and the Hillsdale urban areas. Another influence on the future economic growth of Davie County is the potential for industrial development along primary corridors such as I-40. Additionally, Davie County may emerge as a distribution center due to its strategic location within the Piedmont Triad.

Land Use

Land use refers to the physical patterns of activities and functions within a municipality or county. Traffic problems in a given area often can be attributed to adjacent land use. For example, a large industrial plant may cause congestion during shift change hours on a road that otherwise has little, if any, congestion. The spatial distribution of different types of land uses is a predominant determinant of when, where, and to what extent traffic congestion occurs. The travel demand between different land uses and the resulting impact on traffic conditions varies depending on the size, type, intensity, and spatial separation of development.

For use in transportation planning, land uses are grouped into the categories defined below.

- **Residential** - land devoted to the housing of people (excludes hotels and motels)
- **Commercial** - land devoted to retail trade, including consumer and business services and offices
- **Industrial** - land devoted to manufacturing, storage, warehousing, and transportation of products
- **Public** - land devoted to social, religious, educational, cultural, and political activities

Figure 6 shows the area's existing land use map and Figure 7 shows the projected land use for the area. Both figures were provided by the Davie County Planning & Zoning Department.

Anticipated future land use is a logical extension of the present spatial distribution. Determination of where and what type of growth is expected to occur within the planning area facilitates developing proposed thoroughfares or the improvement of existing thoroughfares. Areas of anticipated development and growth for Davie County are listed below.

- Residential - Farmington, Jerusalem, Mocksville, and Shady Grove Townships
- Commercial/Retail - Farmington, Jerusalem, and Mocksville Townships
- Industrial - Jerusalem, Mocksville and Shady Grove Townships
- Public - Farmington, Fulton, Mocksville, and Shady Grove Townships. There will also be continued preservation of the Yadkin River, waterfront property, and all historic districts

The largest growth expectations are for central and northeastern Davie County. This development is anticipated primarily in the Mocksville and Hillsdale urban areas. The slowest growth expectations are for the western portions of the county. This slow growth is primarily attributed to its agricultural characteristics.

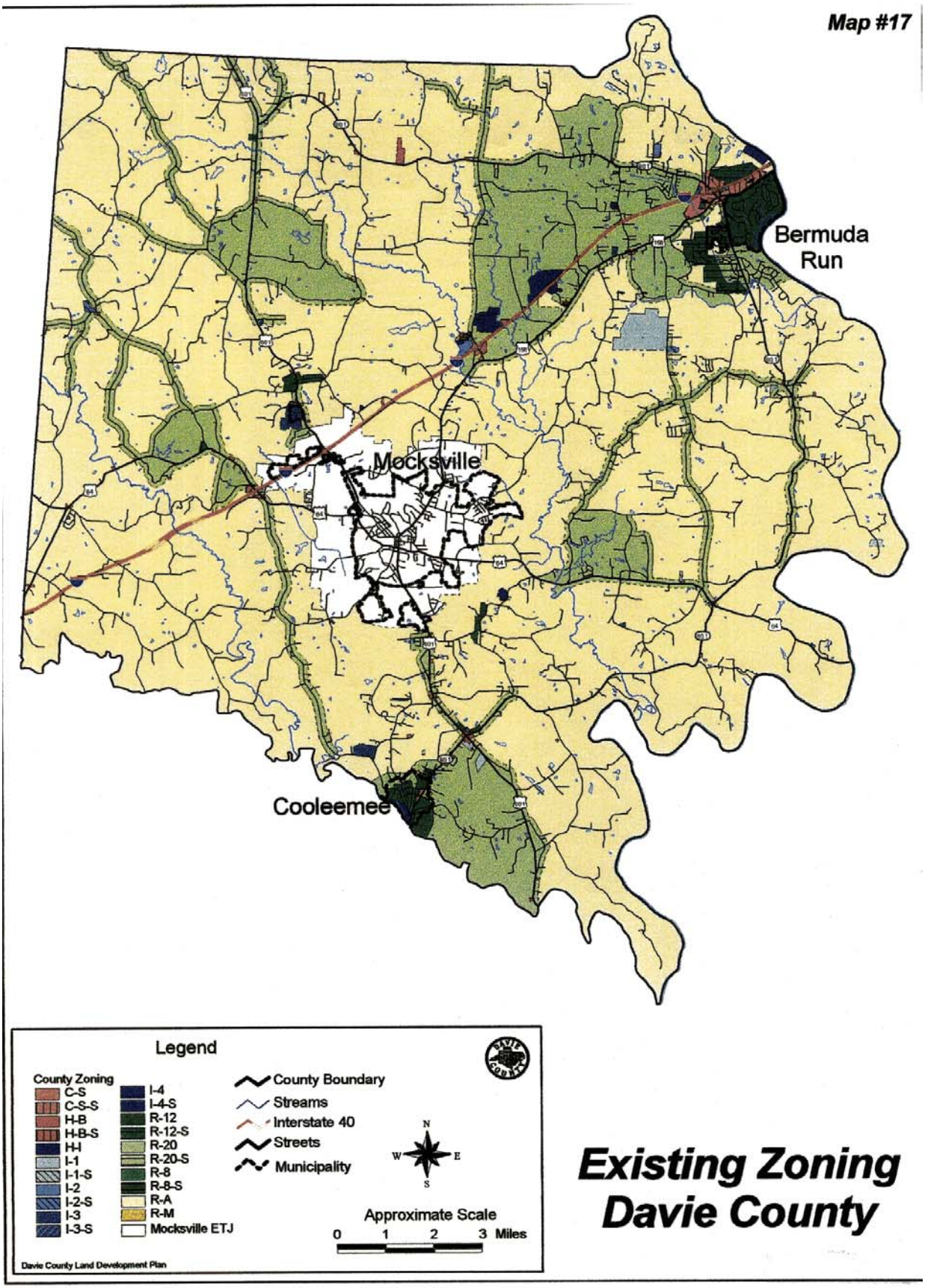

Map #17
Bermuda Run
Mocksville
Cooleemee
Legend
County Zoning
C-S
C-S-S
H-B
H-B-S
H-I
I-1
I-1-S
I-2
I-2-S
I-3
I-3-S
I-4
I-4-S
R-12
R-12-S
R-20
R-20-S
R-8
R-8-S
R-A
R-M
Mocksville ETJ
County Boundary
Streams
Interstate 40
Streets
Municipality
N
W
E
S
Approximate Scale
0 1 2 3 Miles
Davie County Land Development Plan
Existing Zoning
Davie County

FIGURE 6

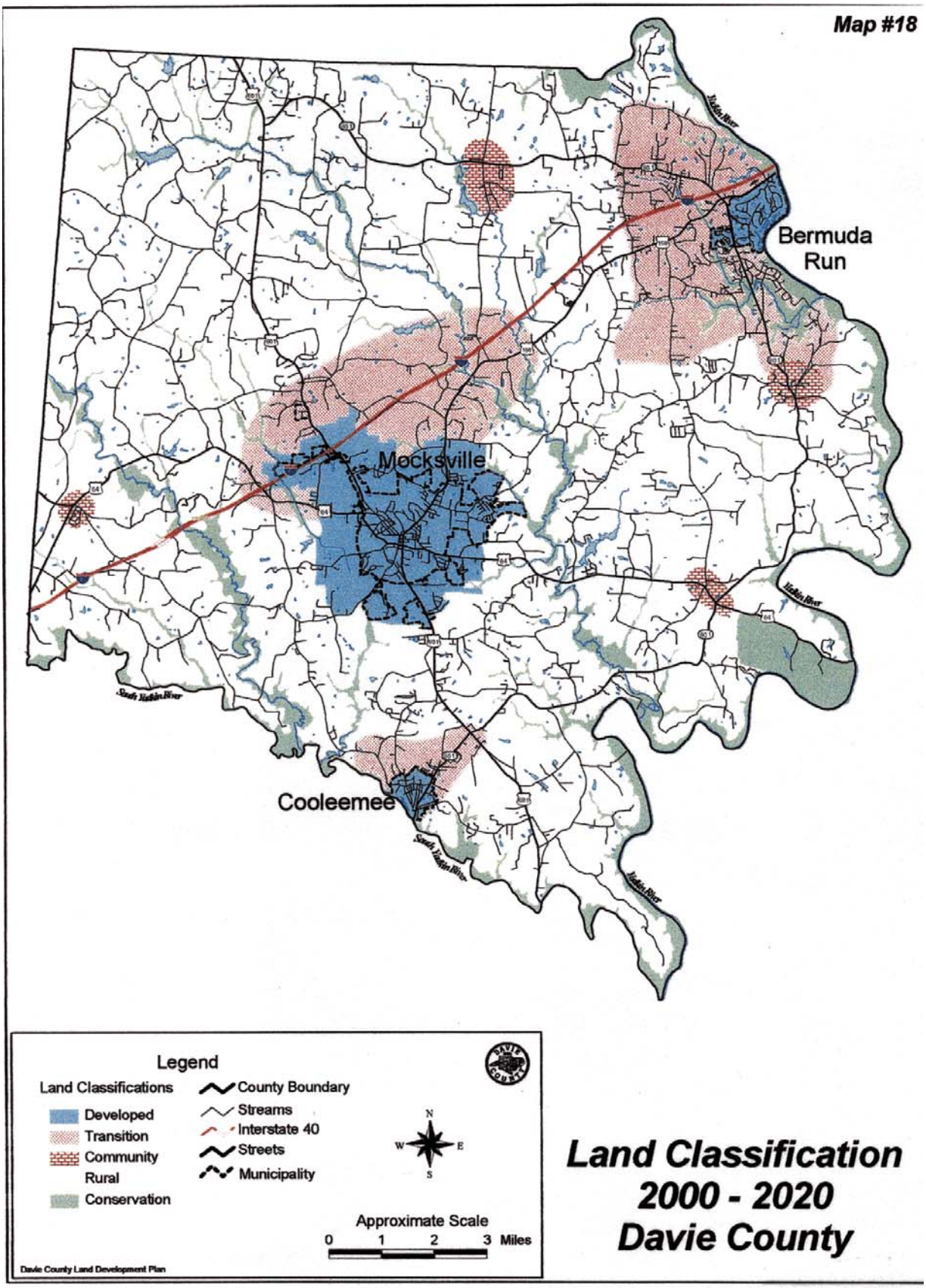

Map #18
Bermuda Run
Mocksville
Cooleemee
South Yadkin River
Yadkin River
Legend
Land Classifications
Developed
Transition
Community
Rural
Conservation
County Boundary
Streams
Interstate 40
Streets
Municipality
N
W
E
S
Approximate Scale
0 1 2 3 Miles
Davie County Land Development Plan
Land Classification
2000 - 2020
Davie County

FIGURE 7

Forecasted Travel Patterns and Deficiencies

Future Travel Demand

Future travel demand can be forecasted by looking at past traffic trends and calculating the average annual growth rates for specific routes. Using historical traffic trends, along with projected land use and projected population growth, future travel demand can be estimated and future transportation deficiencies can be identified. For this thoroughfare plan study average daily traffic (ADT) counts for the past thirty years were used in a linear regression analysis to estimate ADT for the planning year 2030. The projected 2030 ADT for Davie County's functionally classified roads are shown in Figure 8 and listed in Appendix B, Table B-1.

Capacity Deficient Corridors

Capacity deficient corridors are identified using the volume to capacity ratio (V/C), which is the projected traffic over the practical capacity of the facility for a given level of service (LOS). For this analysis, capacity is based on LOS C, except LOS B for rural roadways functionally classified as arterials. A V/C ratio greater than one indicates the volume of traffic on the road exceeds its capacity and the facility should be considered for improvement. Based on this analysis, the roads in Davie County listed below are anticipated to be over capacity by the planning year 2030.

- I-40: From Forsyth County to SR 1410 (Farmington Road)
- US 601: From SR 1414 (Ferebee Road) to the northern Mocksville Urban Planning Boundary (MUPB) and from the southern MUPB to Rowan County
- US 158: From Forsyth County to SR 1442 (Redland Road)
- US 64: From I-40 to the western MUPB and from the eastern MUPB to Davidson County
- NC 801: From I-40 to SR 1624 (Old NC 801)

I-40, US 64, and NC 801 are scheduled for improvements in the 2002-2008 Transportation Improvement Program (TIP). Refer to Figure 9 for depiction of these deficient corridors and to Chapter 2 for recommendations. Widening these facilities will increase their traffic carrying ability and alleviate traffic congestion. The existing and recommended capacities, right-of-way, and cross sections for Davie County's functionally classified roads are given in Appendix B, Table B-1.

Roads Approaching Capacity

Roads in the planning area that are expected to be near capacity within the planning period are listed below:

- I-40: From SR 1410 (Farmington Road) to the northern MUPB and from the western MUPB to Iredell County
- US 158: From SR 1410 (Farmington Road) to the northern MUPB
- US 64: From Iredell County to I-40

- NC 801: From SR 1410 (Farmington Road) to I-40 and from US 601 to Rowan County
- SR 1410 (Farmington Road): From NC 801 to US 158

Refer to Figure 9 for depiction of these deficient corridors and to Chapter 2 for recommendations. Widening these facilities will increase their traffic carrying ability and alleviate traffic congestion. The existing and recommended capacities, right-of-way, and cross sections for Davie County's functionally classified roads are given in Appendix B, Table B-1.

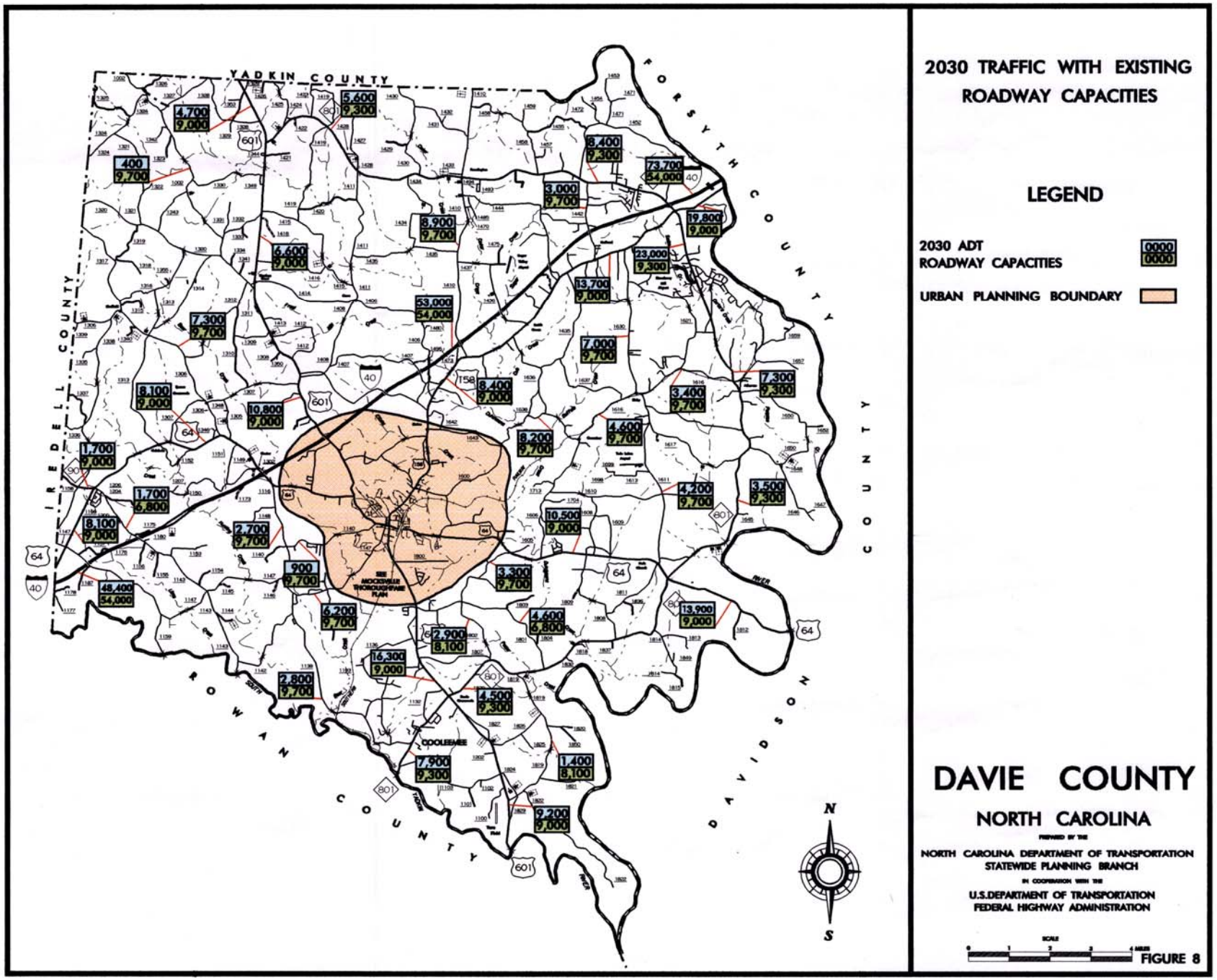
System Deficiencies

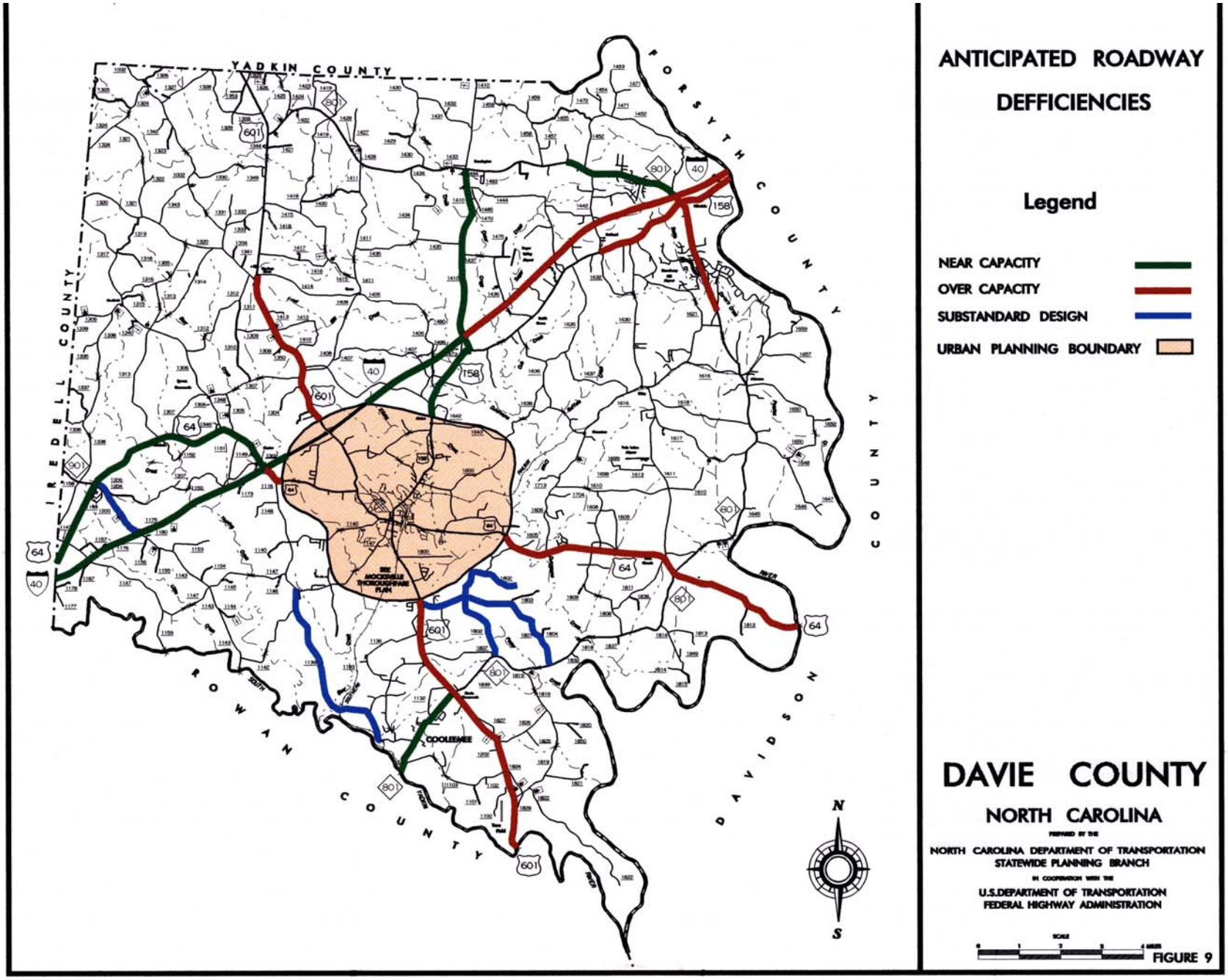
System deficiencies result in areas that lack a cohesive, continuous, and complimentary major road network. More simply put, a system deficiency exists when drivers must go out of their way to get to their desired destination, or when the route is not cohesive or continuous. For Davie County, no system deficiencies were identified that warrant improvements.

Intersection Deficiencies

Ineffective intersection design or control can contribute to poor traffic flow, increased traffic accidents, and driver irritation. Most of the major traffic intersections in Davie County are located within the municipalities. Analysis of Davie County's roadway system revealed that the following intersections exhibit the aforementioned deficiency.

- SR 1611 (Fork Bixby road) and SR 1630 (Baltimore Road)
- SR 1632 (Junie Beauchamp Road) and US 158
- US 158 and NC 801


YADKIN COUNTY
IREDELL COUNTY
FORSYTH COUNTY
DAVIDSON COUNTY
ROWAN COUNTY
MOCKSVILLE
COOLEEMEE
2030 TRAFFIC WITH EXISTING ROADWAY CAPACITIES
LEGEND
2030 ADT ROADWAY CAPACITIES
URBAN PLANNING BOUNDARY
DAVIE COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
FIGURE 8


YADKIN COUNTY
IREDELL COUNTY
FORSYTH COUNTY
DAVIDSON COUNTY
ROWAN COUNTY
MOCKSVILLE THOROUGHFARE PLAN
COOLEEMEE
ANTICIPATED ROADWAY DEFFICIENCIES
Legend
NEAR CAPACITY
OVER CAPACITY
SUBSTANDARD DESIGN
URBAN PLANNING BOUNDARY
DAVIE COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
FIGURE 9
N
S

Consideration of Environmental Factors

In recent years, environmental considerations associated with highway improvements or construction have come to the forefront of the planning process. The legislation that dictates the necessary procedures regarding environmental impacts is the National Environmental Policy Act. Section 102 of this act requires the execution of an environmental impact statement (EIS) for road projects that have a significant impact on the environment. An EIS includes an evaluation of a project's impact on wetlands, water quality, historic properties, wildlife, and public lands.

Although the technical report for the thoroughfare plan is not intended to cover environmental concerns in as much detail as an EIS, preliminary research on environmental factors is generally done at the thoroughfare planning stage. Refer to figure 10 for a visual representation of environmental factors within Davie County.

Wetlands

In general terms, wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrata that is at least periodically saturated with or covered by water. Water creates severe physiological problems for all plants and animals except those that are adapted for life in it or in saturated soil.

Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes, and streams by slowly storing and releasing floodwaters. They help maintain the quality of our water by storing nutrients, reducing sediment loads, and reducing erosion. They are also critical to fish and wildlife populations. Wetlands provide an important habitat for about one third of the plant and animal species that are federally listed as threatened or endangered.

The impacts to wetlands can be evaluated using the National Wetlands Inventory Mapping, available from the U. S. Fish and Wildlife Service. Wetland impacts will be avoided or minimized to the greatest extent possible while preserving the integrity of the thoroughfare plan.

Threatened and Endangered Species

A preliminary review of Federally Listed Threatened and Endangered Species within Davie County was done to determine the effect new corridors could have on wildlife. Threatened or endangered species were identified using mapping from the North Carolina Department of Environment, Health, and Natural Resources.

The Threatened and Endangered Species Act of 1973 allows the U. S. Fish and Wildlife Service to impose measures for mitigation of the environmental impacts of a road project on endangered plants and animals and critical wildlife habitats. By locating rare species in the planning stage of road construction, avoidance or minimization of these impacts is possible.

There were various sightings of rare plants and animals throughout Davie County. Those of particular concern are those located in the vicinity of the proposed roadway improvements. They are listed below.

- Macdonnoa Brunnea (Mayfly)
- Silphium terebinthinaceum (Prairie Duck)
- Hunting Creek (Natural Community)
- Farmington Forest (Natural Community)
- Pinebrook Drive Forest (Natural Community)
- Davie Fault

A detailed field investigation is recommended prior to construction of any highway project or roadway improvement.

Historic Sites

The locations of historic sites in Davie County were investigated to determine the possible impacts of the various projects studied. The federal government has issued guidelines requiring all state transportation departments to make special efforts to preserve historic sites. In addition, the State of North Carolina has issued its own guidelines for the preservation of historic sites. These two pieces of legislation are described below.

National Historic Preservation Act - Section 106 of this act requires state departments of transportation to identify historic properties listed in the National Register of Historic Places and properties eligible to be listed. State departments of transportation must consider the impacts of its road projects on these properties and consult with the Federal Advisory Council on Historic Preservation.

NC General Statute 121-12(a) - This statute requires the NCDOT to identify historic properties listed on the National Register, but not necessarily those eligible to be listed. NCDOT must consider impacts and consult with the North Carolina Historical Commission, but is not bound by their recommendations.

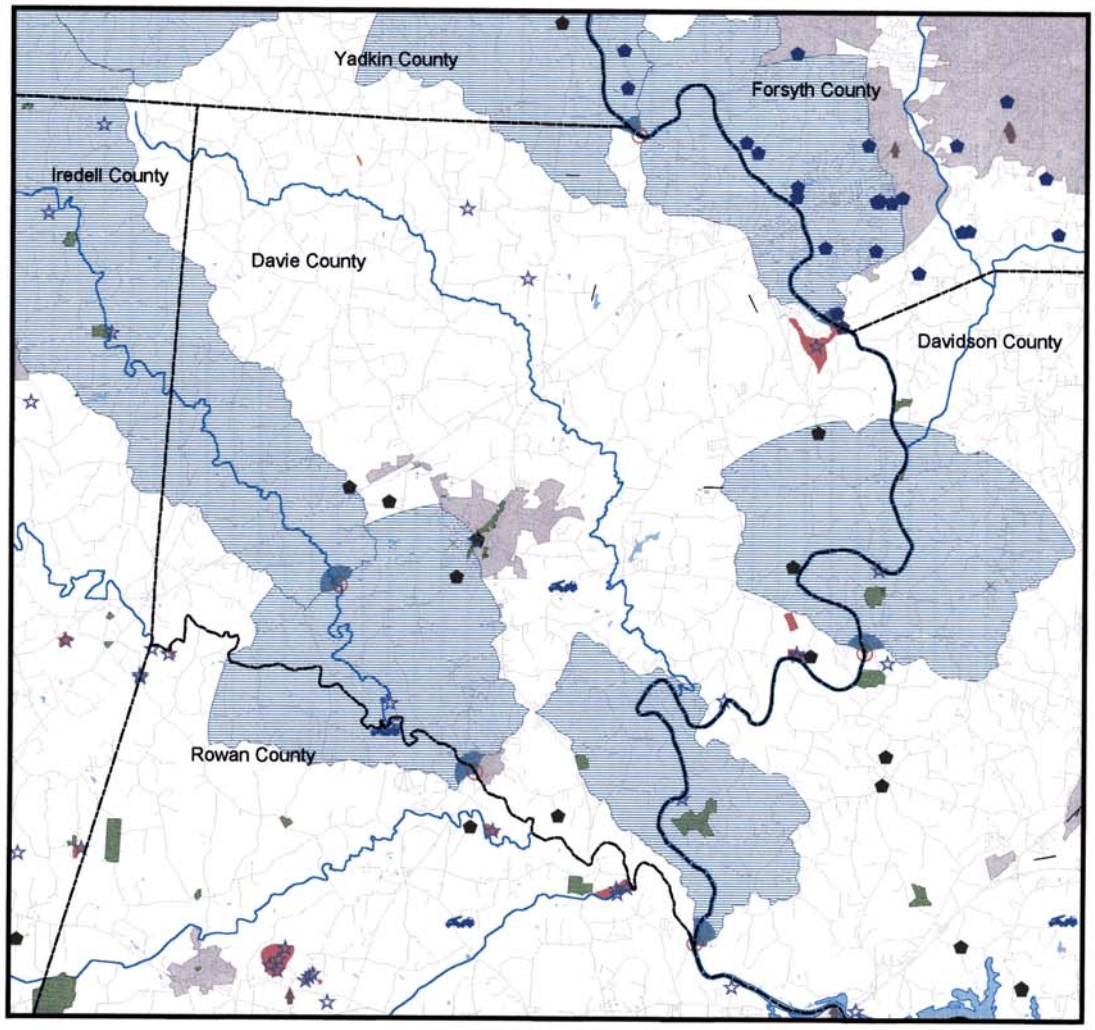
The State Plan for Historic Preservation was used to identify sites within Davie County. Many of these sites are located in the rural areas of the county. The sites of primary concern are listed below.

- Center Arbor
- Boxwood Lodge
- Foard-Tatum House
- Cooleemee Plantation
- Fulton United Methodist Church
- John Edward Schutt House

All reasonable efforts will be made to minimize the impact to identified historic sites and natural settings when widening existing roadways or constructing new facilities. None of the other properties should be affected by the projects proposed on the thoroughfare plan. However, care should be taken to make certain that all historic sites and natural settings are preserved. Therefore, a more detailed study should be done in regard to local historic sites prior to construction of any project.

Archaeology

There were numerous archaeology sites of significance located in the county. These sites were located along several routes that are recommended for improvements. All efforts will be made to avoid or minimize any impacts to archaeological sites prior to any roadway improvements or construction. Therefore, a more detailed study should be done in regard to local archaeological sites prior to construction of any project or roadway improvement.



Davie County Environmental Data

LEGEND

- Surface Water Intakes (100k)
- Nat. Heritage Occurence Sites (Restricted-100k)
- Archaeological Sites (Restricted-24k)
- Archaeological Sites (Restricted 24k)
- Hist. Struct.-NR (Restricted-100k)
- Hist. Dist. -NR (Restricted-100k)
- Hist. Struct.-SL(Restricted-100k)
- Hist. Dist.-SL(Restricted-100k)
- Solid Waste Facilities (24k)
- Hazardous Waste Facilities (Unverified 24k)
- Superfund Pts. (Haz. Subs. Dispos. Sites)
- Superfund Areas (Haz. Subs. Dispos. Sites)
- Artificial Marine Reefs(100k)
- Sub.Root Vasculars (point-24k)
- Sub. Root Vasculars (poly-24k)
- Roads (100k TIGER w/ attributes)

Airports / Substations

- Airport
- Power Substation
- Prop. Critical Habitat Areas (1 mile buffer-24k)
- Trout Streams (WRC - 100k)
- Trout Streams (DWQ - 100k)
- Anadromous Fish Spawning Areas (100k)
- Fish Nursery Areas (24k)

DCM Wetlands

- Estuarine
- Pocosin
- Riverine
- Flats
- Drained Wetland
- Cutover Wetland
- Hydro -Water Bodies (100k)
- Hydro - Major Rivers/Streams (100k)
- Hydro - Major Water Bodies (100k)
- HQW Zones (100k)

Water Supply Watersheds (24k)

- Critical
- Protected
- Natural Areas (Restricted-24k)
- Municipal Boundaries (24k)

N

FIGURE 10

Appendix A
Thoroughfare Planning Principles

There are many advantages to thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed to serve future travel desires. Thus, the main consideration in thoroughfare planning is to make provisions for street and highway improvements so that, when the need arises, feasible opportunities to make improvements exist.

Benefits of Thoroughfare Planning

There are two major benefits derived from thoroughfare planning. First, each road is designed to perform a specific function and provide a specific level of service. This permits savings in right-of-way, construction, and maintenance costs. It also protects residential neighborhoods and encourages stability in travel and land use patterns. Second, thoroughfare planning allows local officials to be informed of future improvements and enables them to incorporate this information into planning and policy decisions. This permits developers to design subdivisions in a non-conflicting manner, enables school and park officials to better locate their facilities, and minimizes the damage to property values and community appearance that could otherwise be associated with roadway improvements.

County Thoroughfare Planning Concepts

The purpose of the thoroughfare planning is to provide a functional roadway system that permits direct, efficient, and safe travel. Different elements in the system are designed to have specific functions and levels of service, thus minimizing the traffic and land service conflict.

In a county thoroughfare plan, elements are either urban or rural. In an urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan exists, elements are rural and are under the planning jurisdiction of the county.

Within both urban and rural systems, transportation elements are classified according to the specific function they are designed to perform. A discussion of the elements and functions of the two systems follows.

Thoroughfare Classification Systems

Roads perform two primary functions, traffic service and land access. These functions can be served effectively when both traffic volumes and demand to access land are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely developed abutting property may lead to intolerable traffic flow friction and congestion.

The underlying concept of a thoroughfare plan is that it provides a functional system of roads that permits travel from origins to destinations with directness, ease, and safety. Different roads in this system are designed to perform specific functions, thus minimizing the conflict between traffic service and land access.

Urban Classification

For urban thoroughfare plans, roadways are classified as major thoroughfares, minor thoroughfares, or local access streets.

Major Thoroughfares
These routes are the primary traffic arteries of the urban area and they accommodate traffic movements within, around, and through the area.

Minor Thoroughfares
Roadways classified as this type collect traffic from the local access streets and carry it to the major thoroughfare system.

Local Access Streets
This classification includes all streets that have a primary purpose of providing access to the abutting property. This category is further classified as either residential, commercial and/or industrial, depending upon the type of land use that is served.

Due to the limited amount of detail that can be shown on a county thoroughfare plan, only urban major thoroughfares are shown.

Rural Classification

A rural classification system is used for county thoroughfare plans, which also show the major thoroughfares within urban thoroughfare planning boundaries. There are four major systems in the rural classification system: principal arterials, minor arterials, major and minor collectors, and local roads.

Rural Principal Arterial System
The principal arterial system is a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. Longer trip lengths and greater travel densities characterize this type of travel. The principal arterial system should serve all urban areas of over 50,000 in population and most of those with a population greater than 5,000. The interstate system constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System
The minor arterial system forms a network that links cities, large towns, and other major traffic generators, such as large resorts. The minor arterial system generally serves intrastate and intercounty travel and travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

Rural Collector Road System

The rural collector routes generally serve intracounty travel. These routes serve travel whose distances are shorter than on the arterial routes. The rural collector road system is subclassified into major and minor collector roads.

Major Collector Roads

These routes provide service to most sizable towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, significant mining and agricultural areas, etc. Major collector roads also link these places to routes of higher classification and serve the more important intracounty travel corridors.

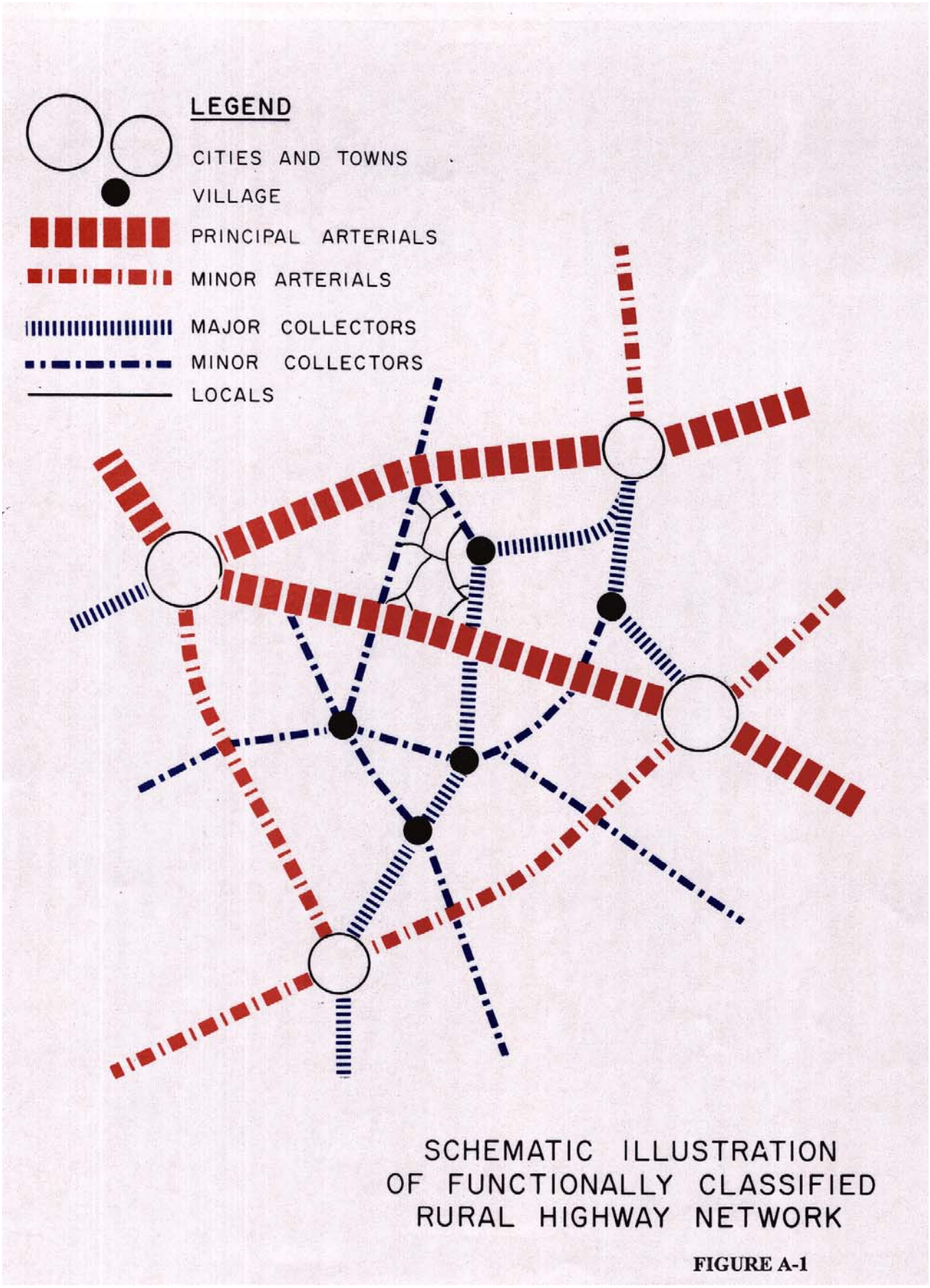
Minor Collector Roads

These roads collect traffic from local roads and provide a link within a reasonable distance to a major collector road. Minor collectors also provide service to the remaining smaller communities and link rural areas to the locally important traffic generators.

Rural Local Road System

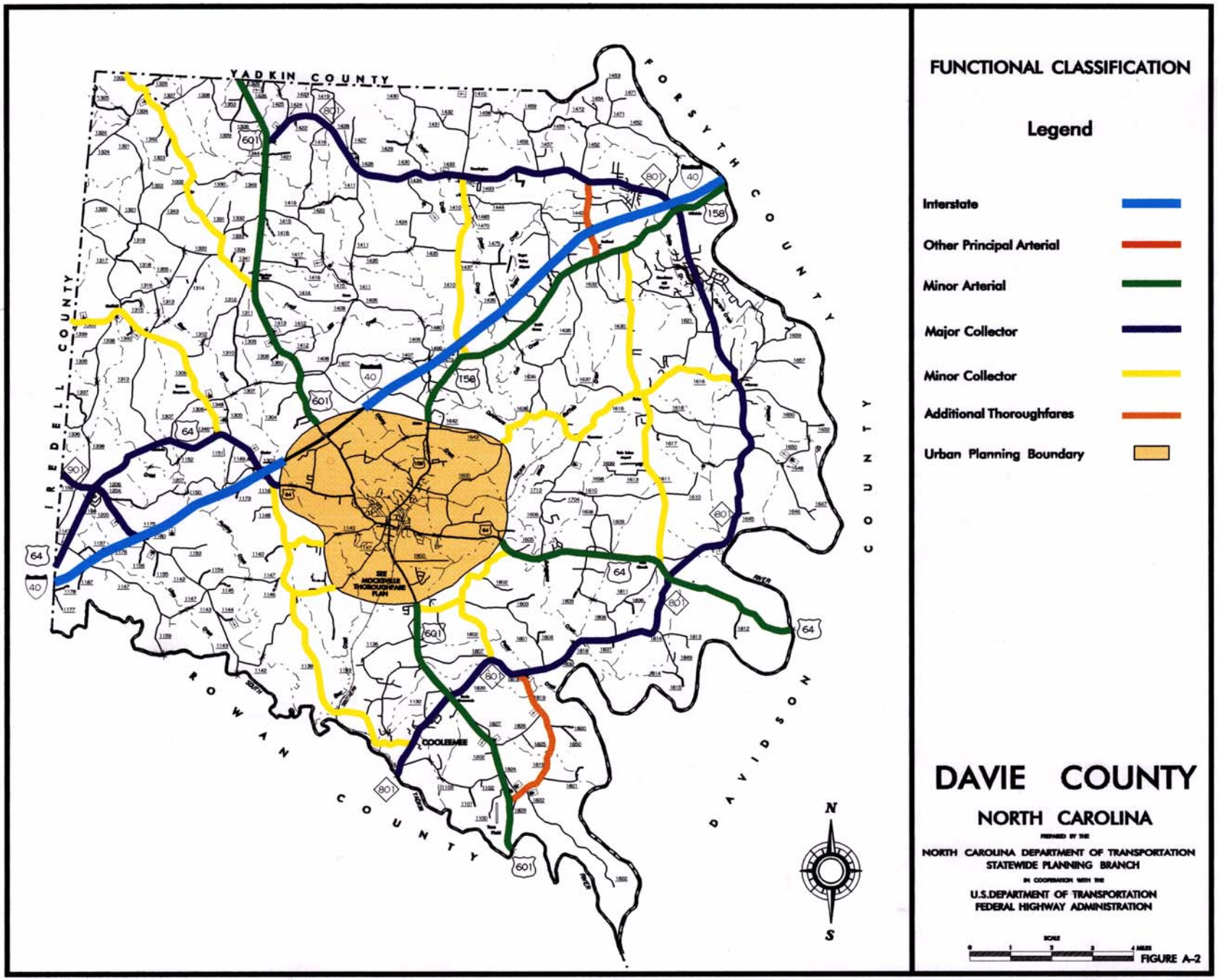
The local road system consists of all facilities not on a higher system. Local residential streets and residential collector streets are elements of this system. Facilities designated as local residential streets are either cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length. These streets do not connect thoroughfares or serve major traffic generators and do not collect traffic from more than one hundred dwelling units. Residential collector streets serve as the connecting street system between local residential streets and the thoroughfare system.

Figure A-1 gives a schematic illustration of the functional classification of a rural highway system. The functional classification for the County is shown in Figure A-2.



SCHEMATIC ILLUSTRATION
OF FUNCTIONALLY CLASSIFIED
RURAL HIGHWAY NETWORK

FIGURE A-1


YADKIN COUNTY
IREDELL COUNTY
FORSYTH COUNTY
DAVIDSON COUNTY
ROWAN COUNTY
SEE MOCKSVILLE THOROUGHFARE PLAN
COOLEEMEE
N
S
FUNCTIONAL CLASSIFICATION
Legend
Interstate
Other Principal Arterial
Minor Arterial
Major Collector
Minor Collector
Additional Thoroughfares
Urban Planning Boundary
DAVIE COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
0 1 2 3 4 MILES
FIGURE A-2

Objectives of Thoroughfare Planning

Thoroughfare planning is the process public officials use to assure the development of the most appropriate roadway system to meet existing and future travel desires within the urban area or county. The primary aim of a thoroughfare plan is to guide the development of the roadway system in a manner consistent with changing traffic patterns. Thoroughfare planning enables road improvements to be made as traffic demands increase and ensure only needed improvements are implemented, eliminating the expense of unnecessary projects. By developing the roadway system to keep pace with increasing traffic demands, maximum utilization of the system can be attained, requiring a minimum amount of land for transportation purposes. In addition to providing for traffic needs, urban thoroughfare plans should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The present and future population dispersion, as well as commercial and industrial development, affect major street and highway locations. Conversely, the location of major streets and highways within a given area influences the local development pattern.

Objectives of a thoroughfare plan include:

- To provide for the orderly development of an adequate major roadway system as land development occurs;
- To reduce travel and transportation costs;
- To reduce the cost of major roadway improvements to the public through the coordination of the roadway system with private action;
- To enable private interest to plan their actions, improvements, and development with full knowledge of public intent;
- To minimize disruption and displacement of people and businesses through long range advance planning for major roadway improvements;
- To reduce environmental impacts, such as air pollution, resulting from transportation, and
- To increase travel safety.

These objectives are achieved through improving both the operational efficiency of thoroughfares, and improving the system efficiency through system coordination and layout.

Operational Efficiency

The operational efficiency of a road is improved by increasing the capability of the street to carry more vehicular traffic and people. In terms of vehicular traffic, a road's capacity is defined by the maximum number of vehicles that can pass a given point on a road during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, prevailing traffic characteristics, and weather.

Physical ways to improve vehicular capacity include:

- **Roadway widening -** Widening of a road from two to four lanes more than doubles the capacity of the road by providing additional maneuverability for traffic.
- **Intersection improvements -** Increasing the turning radii, adding exclusive turn lanes, and channelizing movements can improve the capacity of an existing intersection.
- **Improving vertical and horizontal alignment -** Alignment improvements reduce congestion caused by slow moving vehicles.
- **Eliminating roadside obstacles -** Improving lateral clearance reduces side friction and improves a driver's field of sight.

Operational ways to improve a road's capacity include:

- **Control of Access -** A roadway with complete access control can often carry three times the traffic handled by a non-controlled access road with identical width and number of lanes.
- **Parking removal -** Capacity is increased by providing additional roadway width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.
- **One-way operation -** The capacity of a street can be increased by 20 -50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.
- **Reversible lanes -** Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.
- **Signal phasing and coordination -** Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced in the following ways:

- **Carpools -** Encouraging the formation of carpools and vanpools for journeys to work and other trip purposes reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.
- **Alternate mode -** Encouragement of transit and bicycle use reduces vehicular congestion.
- **Work hours -** Programs by industries, businesses, and institutions to stagger work hours or establish variable work hours for employees spreads peak travel over a longer time period and thus reduces peak hour demand.
- **Land use -** Planning land use can control development or redevelopment in a more travel efficient manner.

System Efficiency

Another means for altering travel demand on existing facilities is the development of a more efficient system of roads that will better serve travel desires. A more efficient transportation system can reduce travel distances, time, and user costs. Improvements in system efficiency can be achieved through the concept of functional classification of roads and development of a coordinated major street system.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of thoroughfare classification systems, operational efficiency and system efficiency, are conceptual tools available to aid in developing a thoroughfare plan. However, in practice thoroughfare planning is done for established urban areas or counties and is constrained by existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect road locations.

Through the thoroughfare planning process it is necessary, from a practical viewpoint, that certain basic principles be followed as closely as possible. These principles are listed below.

1. The plan should be derived from a thorough knowledge of existing travel - its component parts, and the factors that contribute to it, limit it, and modify it.

2. Traffic demands must be sufficient to warrant the designation and development of each facility. The thoroughfare plan should be designed to accommodate a large portion of major traffic movements on a few roads.

3. The plan should conform to and provide for the land development plan for the area.

4. Certain considerations must be given to development beyond the current planning period. Particularly in outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights-of-way for future thoroughfare development.

5. While being consistent with the above principles and realistic in terms of travel trends, the thoroughfare plan must be economically feasible.

Appendix B
Thoroughfare Plan Street Tabulation and Recommendations

This appendix includes a detailed tabulation of all roads identified as elements of the Davie County Thoroughfare Plan. The table includes a description of the roads by sections, as well as the length, cross section, and right-of-way for each section. Also included are the existing and projected average daily traffic volumes, the practical roadway capacity, and the recommended ultimate lane configuration. It should be noted that the practical capacities for rural roadways are based on a level of service of B for roads functionally classified as arterials and level of service C for all other roads. The practical capacity for all roads in the developed areas of the county are based on a level of service B. Refer to Chapter 4 for a description and illustration of the levels of service and Figure A-2 for the functional classification of Davie County roads. Due to space constraints, the recommended cross-sections are given in the following form: number of lanes/ alphabetic code. A detailed description and illustrative figure for each of the alphabetic codes for cross sections can be found in Appendix C.

The following index of terms may be helpful in interpreting the table:

ADQ – Adequate
ADT – Average Daily Traffic
CL – City Limit
DIST – Distance
FT. – Feet
MI. – Miles
MUPB – Mocksville Urban Planning Boundary
NO. – Number
RDWY – Roadway
ROW – Right-of-Way
SECT. – Section
VPD – Vehicles Per Day

Appendix B
Thoroughfare Plan Street Tabulation and Recommendations

FACILITY & SECTION	EXISTING CONDITIONS					ADT		RECOMMENDATIONS		
	DIST. (mi)	RDWY (ft)	ROW (ft)	NO. OF LANES	CAPACITY (vpd)	2000 (vpd)	2030 (vpd)	CROSS SECT.	ROW (ft)	CAPACITY (vpd)
I-40										
Iredell County - SR 1147	1.00	48	200	4	54,000	28,200	48,400	L	300	81,000
SR 1147 - SR 1143	1.40	48	200	4	54,000	28,200	48,400	L	300	81,000
SR 1143 - US 64	3.60	48	200	4	54,000	28,200	48,400	L	300	81,000
US 64 - US 601	1.80	48	200	4	54,000	25,600	44,300	L	300	81,000
US 601 - SR 1410	4.00	48	200	4	54,000	30,000	53,000	L	300	81,000
SR 1410 - NC 801	6.40	48	260	4	54,000	31,700	58,200	L	300	81,000
NC 801 - Forsyth County	1.50	48	260	4	54,000	40,200	73,700	L	300	81,000
US 601										
Yadkin County - NC 801	1.60	30	70	2	9,000	3,300	4,700	ADQ		
NC 801 - SR 1414	3.60	30	60	2	9,000	3,800	6,600	ADQ		
SR 1414 - Northern MUPB	3.70	30	60	2	9,000	6,900	10,800	F	110	37,700
Southern MUPB - US 801	2.40	27	60	2	9,000	10,100	16,300	F	110	37,700
US 801 - Rowan County	4.20	28	60	2	9,000	5,800	9,200	F	110	37,700
US 158										
Forsyth County - Hillsdale CL	1.00	24	120	2	9,000	10,800	19,800	F	110	37,700
Hillsdale CL - US 801	0.30	38	120	3	13,500	10,800	19,800	C	90	35,600
US 801 - SR 1442	2.20	26	120	2	9,000	9,200	13,700	F	110	37,700
SR 1442 - SR 1410	4.10	26	120	2	9,000	3,900	7,000	ADQ		
SR 1410 - MUPB	3.00	26	120	2	9,000	6,100	8,400	F	110	37,700
US 64										
Iredell County - I-40	7.50	26	60	2	9,000	4,700	8,100	F	110	37,700
I-40 - Western MUPB	2.30	30	60	2	9,000	5,800	10,900	F	110	37,700
Eastern MUPB - Fork Church CL	3.20	28	60	2	9,000	2,800	10,500	F	110	37,700
Fork Church CL - US 801	0.80	28	60	2	9,000	5,900	10,300	F	110	37,700
US 801 - Davidson County	3.40	28	60	2	9,000	8,000	13,900	F	110	37,700
NC 901										
Iredell County - US 64	0.80	25	60	2	9,000	1,000	1,700	ADQ		
NC 801										
US 601 - SR 1410	5.40	30	100	2	9,300	3,600	5,600	ADQ		
SR 1410 - SR 1456	2.50	30	100	2	9,300	3,600	5,600	F	110	37,700
SR 1456 - I-40	2.80	30	100	2	9,300	5,400	8,400	F	110	37,700
I-40 - SR 1661	2.00	26	100	2	9,300	11,300	23,000	F	110	37,700
SR 1661 - SR 1624	0.70	26	100	2	9,300	5,500	10,100	F	110	37,700
SR 1624 - SR 1676	1.40	26	100	2	9,300	4,700	8,000	ADQ		
SR 1676 - Advance CL	0.90	24	100	2	9,300	4,800	7,300	ADQ		
Advance CL - US 64	5.30	26	100	2	9,300	2,000	3,500	ADQ		
US 64 - SR 1819	5.00	26	100	2	9,300	2,200	3,800	ADQ		
SR 1819 - US 601	2.00	24	60	2	9,300	2,700	4,500	ADQ		
US 601 - SR 1132	0.70	24	60	2	9,300	5,200	8,100	F	110	37,700
SR 1132 - SR 1139	0.80	24	60	2	9,300	6,300	9,000	F	110	37,700
SR 1139 - Rowan County	0.70	24	60	2	9,300	5,500	7,900	F	110	37,700

Appendix B
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FACILITY & SECTION	EXISTING CONDITIONS					ADT		RECOMMENDATIONS		
	DIST. (mi)	RDWY (ft)	ROW (ft)	NO. OF LANES	CAPACITY (vpd)	2000 (vpd)	2030 (vpd)	CROSS SECT.	ROW (ft)	CAPACITY (vpd)
SR 1819 (Concord Church Road)										
NC 801 - US 601	3.80	20	60	2	8,100	1,100	1,400	ADQ		
SR 1802 (Turrentine Road)										
NC 801 - End of State Maintenance	3.60	20	60	2	8,100	1,500	2,900	K	100	9,700
SR 1801 (Deadmon Road)										
US 601 - NC 801	4.20	18	60	2	6,800	2,500	4,600	K	100	9,700
SR 1632 (Junie Beauchamp Road)										
US 158 - SR 1630	1.60	20	60	2	8,100	-	-	K	100	9,700
SR 1630 (Baltimore Road)										
US 158 - SR 1616	3.60	26	60	2	9,700	4,000	7,000	ADQ		
SR 1616 (Cornatzer Road)										
NC 801 - SR 1611	2.40	26	60	2	9,700	1,900	3,400	ADQ		
SR 1611 - SR 1600	1.80	26	60	2	9,700	2,500	4,600	ADQ		
SR 1611 (Fork Bixby Road)										
SR 1616 - US 64	4.60	24	60	2	9,700	2,500	4,200	ADQ		
SR 1605 (Cornatzer Road)										
SR 1802 - US 64	1.10	24	60	2	9,700	1,800	3,300	ADQ		
SR 1600 (Milling Road)										
SR 1616 - MUPB	2.70	24	60	2	9,700	4,800	8,200	ADQ		
SR 1442 (Redland Road)										
NC 801 - US 158	1.90	24	60	2	9,700	1,700	3,000	ADQ		
SR 1410 (Farmington Road)										
NC 801 - US 158	4.60	24	60	2	9,700	4,900	8,900	F	110	37,700
SR 1306 (Sheffield Road)										
Iredell County - US 64	5.40	24	60	2	9,700	4,100	7,300	ADQ		
SR 1147 (Davie Academy Road)										
SR 1116 - MUPB	2.70	24	60	2	9,700	4,700	6,200	ADQ		
SR 1143 (Davie Academy Road)										
US 64 - I-40	1.70	18	60	2	6800	1,000	1,700	K	100	9,700
SR 1140 (County Home Road)										
MUPB - SR 1116	1.40	25	60	2	9,700	700	900	ADQ		

Appendix B
Thoroughfare Plan Street Tabulation and Recommendations

FACILITY & SECTION	EXISTING CONDITIONS					ADT		RECOMMENDATIONS		
	DIST. (mi)	RDWY (ft)	ROW (ft)	NO. OF LANES	CAPACITY (vpd)	2000 (vpd)	2030 (vpd)	CROSS SECT.	ROW (ft)	CAPACITY (vpd)
SR 1139 (Jericho Road)										
SR 1147 - Sunburst Lane	3.70	18	60	2	6,800	1,500	2,800	K	100	9,700
Sunburst Lane - Cooleemee CL	0.60	24	60	2	9,700	1,500	2,800	ADQ		
Cooleemee CL - NC 801	1.10	24	60	2	9,300	1,500	2,800	ADQ		
SR 1116 (Greenhill Road)										
US 64 - SR 1147	2.40	22	60	2	9,700	1,400	2,700	ADQ		
SR 1002 (Liberty Church Road)										
Yadkin County - US 601	6.80	24	60	2	9,700	220	400	ADQ		

Notes: [1] TIP Project

Appendix C
Typical Thoroughfare Cross Sections

Cross section requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each roadway section must be individually analyzed and its cross section determined based on the volume and type of projected traffic, existing capacity, desired level of service, and available right-of-way. Based on this criteria, recommended typical cross-sections are given in Appendix B, Table B-1. Typical cross section recommendations are shown in Figure C-1. These cross sections are typical for facilities on new location and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross sections should be developed that meet the needs of the project.

On all existing and proposed major thoroughfares delineated on the thoroughfare plan, adequate right-of-way should be protected or acquired for the recommended cross sections. In addition to cross-section and right-of-way recommendations for improvements, Table B-1 may recommend ultimate needed right-of-way for the following situations:

- thoroughfares which may require widening after the current planning period,
- thoroughfares which are borderline adequate and accelerated traffic growth could render them deficient, and
- thoroughfares where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

Recommended design standards relating to grades, sight distances, degree of curve, super elevation, and other considerations for thoroughfares are given in Appendix D. The typical cross sections are described below.

A - Four Lanes Divided with Median - Freeway

Cross-section "A" is typical for four lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 46 feet, but a wider median is desirable.

B - Seven Lanes - Curb & Gutter

Cross section "B" is typically not recommended for new projects. When the conditions warrant six lanes, cross section “D” should be recommended. Cross section “B” should be used only in special situations such as when widening from a five-lane section and right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section “D” is the final cross section.

C - Five Lanes - Curb & Gutter

Typical for major thoroughfares, cross section "C" is desirable where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

D - Six Lanes Divided with Raised Median - Curb & Gutter/ E - Four Lanes Divided with Raised Median - Curb and Gutter

Cross sections "D" and "E" are typically used on major thoroughfares where left turns and intersection streets are not as frequent. Left turns would be restricted to a few selected intersections. The 16 ft median is the minimum recommended for an urban boulevard type cross section. In most instances, monolithic construction should be utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In special cases, grassed or landscaped medians result in greatly increased maintenance costs and an increase in danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F - Four Lanes Divided - Boulevard, Grass Median

Cross-section "F" is typically recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 ft is recommended with 30 ft being desirable.

G - Four Lanes - Curb & Gutter

Cross section "G" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections. This cross section should be used only if the above criteria is met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

H - Three Lanes - Curb & Gutter

In urban environments, thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section “H”.

I - Two Lanes - C&G, Parking both sides: J - Two Lanes - C&G, Parking one side

Cross sections “I” and “J” are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section “I” would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

K - Two Lanes - Paved Shoulder

Cross section "K" is used in rural areas or for staged construction of a wider multi-lane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For areas that are growing and future widening will be necessary, the full right-of-way of 100 ft should be required. In some instances, local ordinances may not allow the full 100 ft. In those cases, 70 ft should be preserved with the understanding that the full 70 ft will be preserved by use of building setbacks and future street line ordinances.

L - Six Lanes Divided with Grass Median - Freeway

Cross section “L” is typical for controlled access freeways. The 46 ft grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 228 ft depending upon cut and fill requirements.

M - Eight Lanes Divided with Raised Median - Curb & Gutter

Also used for controlled access freeways, cross section "M" may be recommended for freeways going through major urban areas or for routes projected to carry very high volumes of traffic.

N - Five Lanes/C&G, Widened Curb Lanes; O - Two Lane/Shoulder Section; P - Four Lanes Divided/Raised Median, C&G, Widened Curb Lanes

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities. Cross sections “N”, “O”, and “P” are typically used to accommodate bicycle travel.

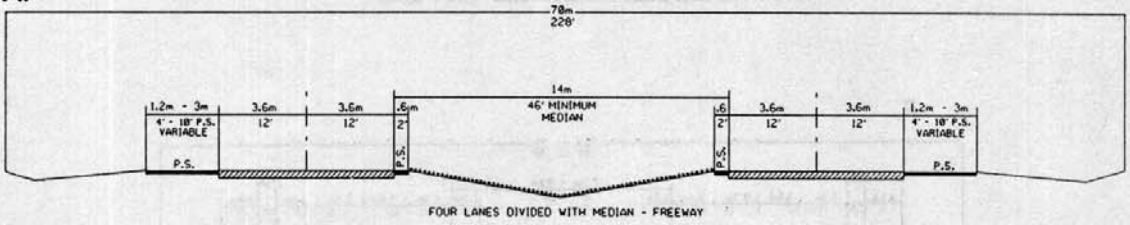
General

The urban curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The right-of-way shown for each typical cross section is the minimum amount required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

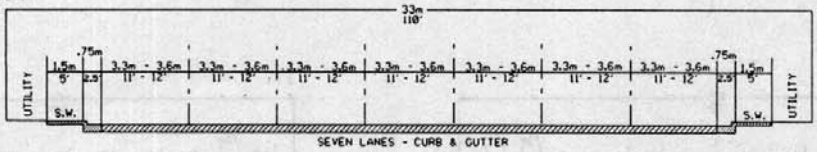
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



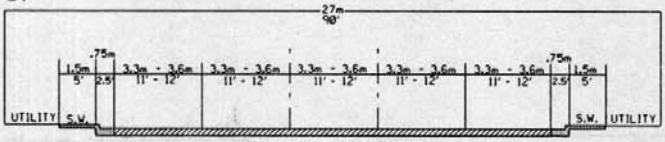
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



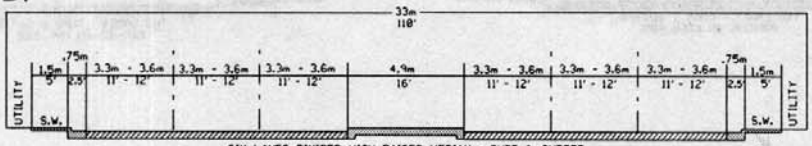
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

D.

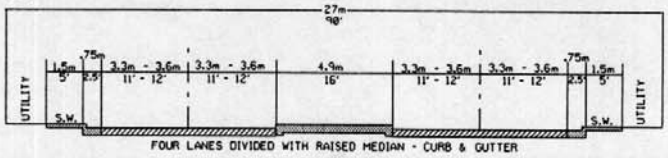


SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

FIGURE C-1

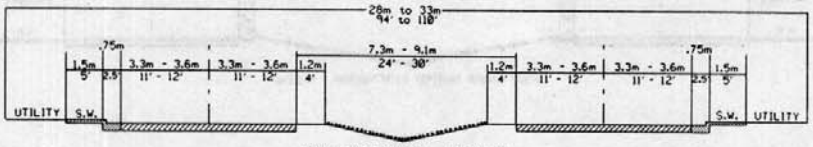
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



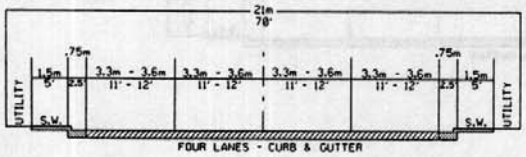
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



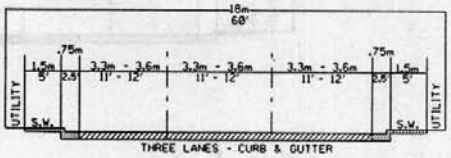
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



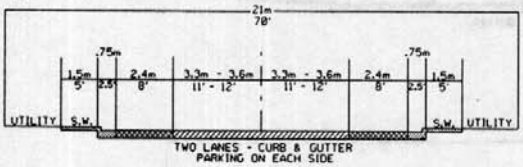
FOUR LANES - CURB & GUTTER

H.



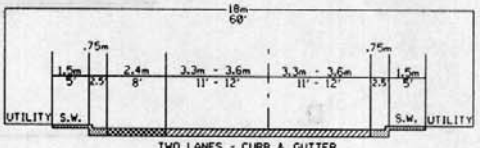
THREE LANES - CURB & GUTTER

I.



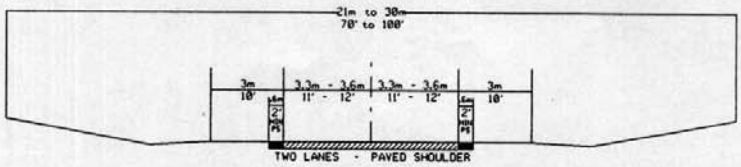
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

K.



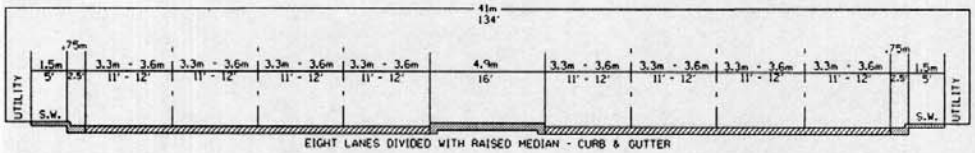
TWO LANES - PAVED SHOULDER

TYPICAL THOROUGHFARE CROSS SECTIONS

L.

SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

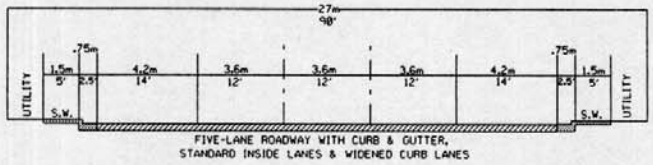
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

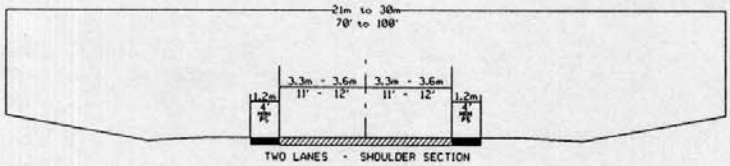
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



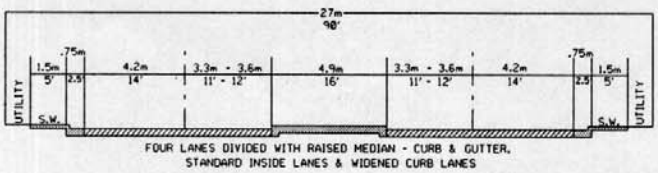
FIVE-LANE ROADWAY WITH CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

Appendix D
Recommended Subdivision Ordinances

Definitions

Streets and Roads

Rural Roads

1. *Principal Arterial* - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of interstate routes and other routes designated as principal arterials.

2. *Minor Arterial* - A rural roadway joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement.

3. *Major Collector* - A road which serves major intracounty travel corridors and traffic generators and provides access to the arterial system.

4. *Minor Collector* - A road which provides service to small local communities and traffic generators and provides access to the major collector system.

5. *Local Road* - A road which serves primarily to provide access to adjacent land, over relatively short distances.

Urban Streets

1. *Major Thoroughfares* - Major thoroughfares consist of interstate, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. *Minor Thoroughfares* - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.

3. *Local Street* - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

Specific Type Rural or Urban Streets

1. *Freeway, expressway, or parkway* - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A *freeway* provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. An *expressway* is a facility with full or partial control of access and generally

with grade separations at major intersections. A *parkway* is for non-commercial traffic, with full or partial control of access.

2. *Residential Collector Street* - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. *Local Residential Street* - Cul-de-sacs, loop streets less than 2500 feet in length, or streets less than 1.0 miles in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. *Cul-de-sac* - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. *Frontage Road* - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. *Alley* - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

Property

1. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

2. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

3. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word “lot” includes the words “plat” and “parcel”.

Subdivision

- Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

- Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets.

  The following shall not be included within this definition nor subject to these regulations:

  * the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein,
  * the division of land into parcels greater then 10 acres where no street right-of-way dedication is involved,
  * the public acquisition, by purchase, of strips of land for the widening or the opening of streets, and

* the division of a tract in single ownership whose entire area is no greater than 2 acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

- Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

- Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

Roadway Design Standards

The design of all roads within a planning area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway & Transportation Officials' (AASHTO) manuals.

The provision of right-of-way for roads shall conform and meet the recommendations of the thoroughfare plan, as adopted by the municipality or county. The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally, the proposed streets should be the extension of existing streets if possible.

Right-of-Way Widths

Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the thoroughfare plan.

The subdivider will only be required to dedicate a maximum of 100 feet of ROW. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which ROW is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width ROW, not less then 60 feet, may be dedicated when adjoining undeveloped property is owned or controlled by the subdivider. This is provided that the width of a partial dedication is such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is sub-divided, the remainder of the full required right-of-way shall be dedicated.

Table D-1

Minimum Right-of-way Requirements

Area Classification	Functional Classification	Minimum ROW
RURAL	Principle Arterial	Freeways- 350 ft Other- 200 ft
	Minor Arterial	100 ft
	Major Collector	100 ft
	Minor Collector	80 ft
	Local Road	60 ft[1]
URBAN	Major Thoroughfare	90 ft
	Minor Thoroughfare	70 ft
	Local Street	60 ft [1]
	Cul-de-sac	variable[2]

[1] The desirable minimum ROW is 60 ft. If curb and gutter is provided, 50 ft of ROW is adequate on local residential streets.

[2] The ROW dimension will depend on radius used for vehicular turn around. Distance from edge of pavement of turn around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn around.

Street Widths

Widths for street and road classifications other than local shall be as recommended by the thoroughfare plan. Width of local roads and streets shall be as follows:

- ***Local Residential***
    * Curb and Gutter section: 26 feet, face to face of curb
    * Shoulder section: 20 feet to edge of pavement, 4 feet for shoulders

- ***Residential Collector***
    * Curb and Gutter section: 34 feet, face to face of curb
    * Shoulder section: 20 feet to edge of pavement, 6 feet for shoulders

Geometric Characteristics

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought

adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under the 'Right-of-Way Widths' section shall apply.

1. *Design Speed* - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets are shown in Table D-2.

2. *Minimum Sight Distance* - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the parameters set forth in Table D-3.

3. *Superelevation* - Table D-4 shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

4. *Maximum and Minimum Grades* - The maximum grades in percent are shown in Table D-5. Minimum grade should not be less then 0.5%. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

Table D-2

Design Speeds

Facility Type	Design Speed (mph) Desirable	Minimum Level	Minimum Rolling
RURAL			
Minor Collector Roads (ADT Over 2000)	60	50	40
Local Roads[1] (ADT Over 400)	50	*50	*40
URBAN			
Major Thoroughfares[2]	60	50	40
Minor Thoroughfares	40	30	30
Local Streets	30	**30	**20

Note: *Based on ADT of 400-750. Where roads serve a limited area and small number of units, can reduce minimum design speed. **Based on projected ADT of 50-250. (Reference NCDOT Roadway Design Manual page 1-1B)

[1] Local Roads including Residential Collectors and Local Residential.

[2] Major Thoroughfares other than Freeways or Expressways.

Table D-3

Sight Distance

Design Speed (mph)	Stopping Sight Distance (feet)		Minimum K[1] Values (feet)		Passing Sight Distance (feet)
	Desirable	Minimum	Crest Curve	Sag Curve	For 2-lanes
30	200	200	30	40	1100
40	325	275	60	60	1500
50	475	400	110	90	1800
60	650	525	190	120	2100

Note: General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case. (Reference NCDOT Roadway Design Manual page 1-12 T-1)

[1]K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length of the vertical curve, which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990".

Table D-4

Superelevation

Design Speed (mph)	Minimum Radius of Maximum e[1]			Maximum Degree of Curve		
	e=0.04	e=0.06	e=0.08	e=0.04	e=0.06	e=0.08
30	302	273	260	19 00'	21 00'	22 45'
60	573	521	477	10 00'	11 15'	12 15'
80	955	955	819	6 00'	6 45'	7 30'
100	1,637	1,432	1,146	3 45'	4 15'	4 45'

[1] e = rate of roadway superelevation, foot per foot

Note: (Reference NCDOT Roadway Design Manual page 1-12 T-6 thru T-8)

Table D-5

Maximum Vertical Grade

Facility Type and Design Speed (mph)	Minimum Grade in Percent		
	Flat	Rolling	Mountainous
RURAL			
Minor Collector Roads*			
20	7	10	12
30	7	9	10
40	7	8	10
50	6	7	9
60	5	6	8
70	4	5	6
Local Roads*[1]			
20	-	11	16
30	7	10	14
40	7	9	12
50	6	8	10
60	5	6	-
URBAN			
Major Thoroughfares[2]			
30	8	9	11
40	7	8	10
50	6	7	9
60	5	6	8
Minor Thoroughfares*			
20	9	12	14
30	9	11	12
40	9	10	12
50	7	8	10
60	6	7	9
70	5	6	7
Local Streets*			
20	-	11	16
30	7	10	14
40	7	9	12
50	6	8	10
60	5	6	-

Note: *For streets and roads with projected annual average daily traffic less than 250 or short grades less than 500 ft long, grades may be 2% steeper than the values in the above table.
(Reference NCDOT Roadway Metric Design Manual page 1-12 T-3)

[1] Local Roads including Residential Collectors and Local Residential.

[2] Major Thoroughfares other than Freeways or Expressways.

Intersections

1.Streets shall be laid out so as to interest as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Offset intersections are to be avoided. Intersections that cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

Cul-de-sacs

Cul-de-sacs shall not be more than 500 feet in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are mode for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least 20 feet.

3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around as may be required by the planning board.

Permits for Connection to State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet form the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Horizontal Width on Bridge Deck

The clear roadway widths for new and reconstructed bridges serving two-lane, two-way traffic should be as follows:

- shoulder section approach:
    * under 800 ADT design year - minimum 28 feet width face to face of parapets, rails, or pavement width plus 10 feet, whichever is greater,
    * 800 - 2000 ADT design year - minimum 34 feet width face to face of parapets, rails, or pavement width plus 12 feet, whichever is greater,
    * over 2000 ADT design year - minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails;

- curb and gutter approach:
    * under 800 ADT design year - minimum 24 feet face to face of curbs,
    * over 800 ADT design year - width of approach pavement measured face to face of curbs,
    * where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face curbs, and in crown drop; the distance from face of curb to face of parapet or rail shall be a minimum of 1.5 feet, or greater if sidewalks are required.

The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

- shoulder section approach - width of approach pavement plus width of usable shoulders on the approach left and right. (shoulder width 8 feet minimum, 10 feet desirable)
- curb and gutter approach - width of approach pavement measured face to face of curbs.

Appendix E
Index for Secondary Road Numbers

- SR 1002 – Liberty Church Road
- SR 1116 – Greenhill Road
- SR 1139 – Jericho Road
- SR 1140 – County Home Road
- SR 1143 – Davie Academy Road
- SR 1147 – Davie Academy Road
- SR 1306 – Sheffield Road
- SR 1410 – Farmington Road
- SR 1442 – Redland Road
- SR 1605 – Cornatzer Road
- SR 1611 – Fork Bixby Road
- SR 1616 – Cornatzer Road
- SR 1630 – Baltimore Road
- SR 1632 – Junie Beauchamp Road
- SR 1801 – Deadmon Road
- SR 1802 – Turrentine Road
- SR 1819 – Concord Church Road

- SR 1600 – Milling Road

Appendix F
Transportation Improvement Program
Project Request Process

The process for requesting projects to be included in the Transportation Improvement Program (TIP) is described briefly in this appendix.

The local representatives should first decide which projects from the thoroughfare plan they would like funded in the TIP. A TIP request for a few carefully selected projects is likely to be more effective than requesting all the projects proposed in the thoroughfare plan. These projects should be prioritized by the local representatives and summarized briefly, as shown on Appendix Page F-3.

After determining which projects are the highest priority for the area, a TIP project request should be sent to the Board of Transportation Member from the municipality's or county's respective district. The TIP project request should include a letter with a prioritized summary of requested projects, as well as a TIP candidate project request form and a project location map for each project. An example of each of these items is included in this appendix.

Example

** Note: This is not an official request submitted to the Board of Transportation. This is intended to be an example of a Transportation Improvement Program (TIP) Request.*

Month ##, Year

North Carolina Board Member
N. C. Board of Transportation
N. C. Department of Transportation
P. O. Box 25201
Raleigh, NC 27611-5201

Dear Board Member:

SUBJECT: 2004-2010 TIP Project Requests for *Generic* County

Enclosed find the projects requested by *Generic* County for consideration in the next TIP update. The list is presented by priority, as approved by the *Generic* County Commissioners at their *Month* meeting.

Generic County also endorsed the existing schedule of projects contained in the current TIP for the county, with one request. The county requests that TIP Project R-*XXXX* remain as a high priority and kept on the existing schedule.

We thank you for the opportunity to participate in development of the State TIP. Please contact us immediately if additional information is needed concerning any of the enclosed project requests.

Sincerely,

John Q. Public

cc: Division Engineer
Enclosure

Generic County
County Commissioners
2002 Proposed Highway Projects (Final)

1) **SR 1111 (Town Street) & SR 1112 (Industry Drive) TIP Project R-XXXX**
   - From SR 1113 (Country Road) to NC 11
   - Widen roadway to a multilane facility, with some new location

2) **US 11**
   - From SR 1112 (Industry Drive) to SR 1113 (Country Road)
   - Widen roadway to a multilane facility

3) **NC 11**
   - From SR 1114 (Any Road) to the existing four lane section just south of I-85
   - Widen roadway to a multilane facility

4) **US 11 Business (Business Road)**
   - From SR 1115 (Some Road) to NC 12
   - Widen facility to a five lane cross section

5) **New Connector**
   - From US 11 to US 112 Business (City Street)
   - New Facility

Highway Program
TIP Candidate Project Request

(Please Provide Information if Available)

Date ##/##/## Priority No. #

County *Generic* City/Town

Requesting Agency *County Commissioners* NCTIP No. *R-####* (if available)

Route (US, NC, SR/Local Name) *SR 1111(Town Street) and SR 1112(Industry Drive)*

Project Location (From/To/Length) *From SR 1113 (Country Road) to NC 11, # # miles*

Type of Project (Widening, New Facility, Bridge Replacement, Signing, Safety, Rail Crossing, Bicycle, Enhancement, etc.)
Widen roadway to a multi-lane facility, with some new location.

Existing Cross Section *24* Feet, Type

Existing Row *60 to 80* Feet Existing ADT *8,000 (1996)*

Estimated Cost, ROW $ *900,000* Construction $ *4,000,000*

Brief Justification for Project *As a major thoroughfare, this facility carries increasing traffic volumes between the industial sites along this route to NC 11 and the I-85 corridor. In the adopted thoroughfare plan for Generic County, it is recommended that this facility should be widen to a multi-lane cross section due to the increasing volume and the potential for more development in this area. The county requests that this project continue to be funded.*

Project Supported By (Agency/Group)

Other Information/ Justification

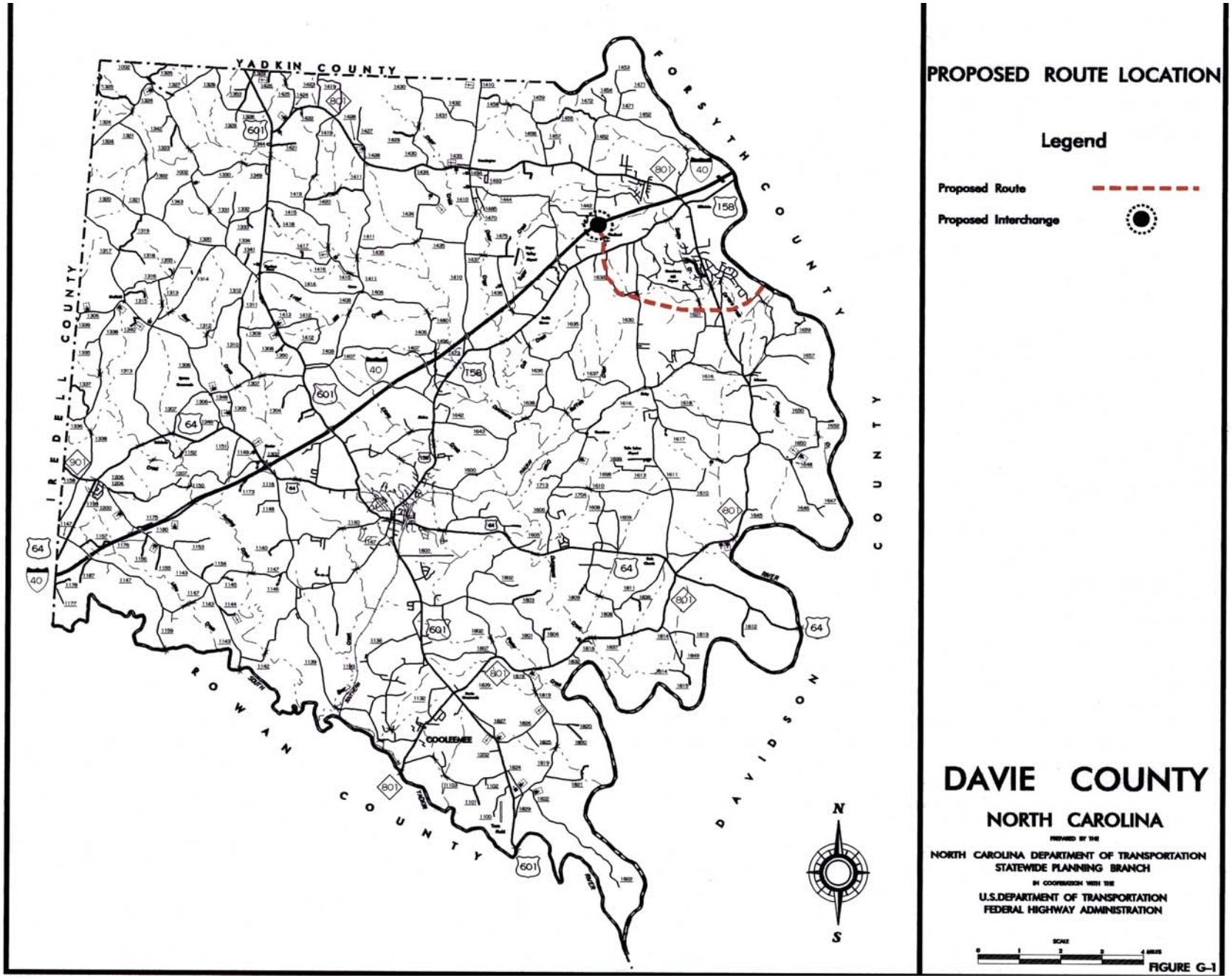
- ☒ Part of Thoroughfare Plan
- ☐ Part of Comprehensive Plan
- ☐ Serves School
- ☐ Serves Hospital
- ☐ Obsolete Facility
- ☐ Serves Park
- ☐ High Accident (#)
- ☐

(Please Attach Map Showing Project Location)

Appendix G
Project Reviews
(*Not included in the thoroughfare plan)*

As a part of the thoroughfare plan study, Davie County recommended studying a proposed route that would provide alternate access into Forsyth County, which provides major employment centers and shopping resources to Davie County residents. This proposed route would include upgrading some existing routes and building portions on new location. It would begin at SR 1410 (Redland Road) and extend southeastward into Forsyth County. The proposed route would include a new interchange at the intersection of SR 1410 (Redland Road) and I-40 and would include an additional bridge crossing of the Yadkin River. The location of this new route is illustrated in Figure G-1. The Department's evaluation and response to Davie County regarding this proposal can be found on pages G-5 and G-6.

Davie County decided to shelf this project and revisit it at a later date. However, the County decided to further evaluate the need for a new interchange at the intersection of SR 1410 (Redland Road) and I-40. It was determined that a proposed interchange at this location would help to alleviate the traffic congestion on I-40, US 801, and US 158 by providing an additional access point to the interstate. It would also increase safety along the aforementioned routes and may help to spur additional economic growth in this area. After holding several public information sessions and public hearings that resulted in substantial opposition to the proposal, the County decided not to pursue this project.



PROPOSED ROUTE LOCATION

Legend

Proposed Route

Proposed Interchange

DAVIE COUNTY

NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE

0 1 2 3 4 MILES

FIGURE G-1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

1554 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1554

W. LYNDO TIPPETT
SECRETARY

July 23, 2001

John Gallimore, Director
Davie County Planning & Zoning
123 South Main Street
Mocksville, NC 27028

Subject: Evaluation of Proposed Facility
Davie County Thoroughfare Plan

Dear Mr. Gallimore:

We have reviewed your request for the new Davie County connector into the Winston-Salem Urban Area. At this time, we can not recommend this new facility as a part of the Davie County Transportation Plan.

We have two concerns about this new facility that warrant us not to put this on the transportation plan. The first major issue we have is how environmentally and financially feasible this project would be to build. There would need to be another crossing of the Yadkin River when there are already three major crossings in Davie County: I-40, US 158, and US 64. The environmental agencies would make this a major issue in their analysis of a new crossing. Their other concern would be the impact it would have on wetland areas, endangered species, and other environmentally sensitive issues around the Yadkin River. Our concern would be how much it wold cost to build a new bridge across the river in relationship to the benefits that would be produced by the new facility.

Another concern is the amount of secondary impacts that this proposal would have on adjacent property. Typically, when a facility such as this is built, adjacent properties experience an enormous amount of secondary growth. Upon reviewing Davie County's Land Development Plan, this type of growth is not planned for the area. Allowing this proposal to be built would promote unplanned and uncontrolled development, which would only lead to further transportation problems. Also, due to the location of the interchange, the FHWA would have to approve an

additional interchange. As the County's vision for a long-range land use plan changes, we will reevaluate the need for a new interchange.

Based on our analysis, we cannot recommend this as a feasible alternative. We feel that the proposed recommendations, which were presented to your planning board, are adequate to handle the transportation needs of Davie County for the planning period. Although we cannot add this to the thoroughfare plan at this time, we will document our investigation into this proposal as a part of the official thoroughfare plan report. This will enable allow the Department to re-evaluate its feasibility as needed in the future.

If you should have any questions or need any additional information, please contact me at (919) 733-4705 or by email at tmarshall@dot.state.nc.us.

Sincerely,

Travis K. Marshall, PE
Small Urban Unit Head
Statewide Planning Branch

cc: Earlene Thomas, EIT, Statewide Planning Branch
Mike Bruff, PE, Assistant Branch Manager, Statewide Planning Branch

Appendix H
Public Involvement

Goals & Objectives Press Release:

News Item December 4, 2000
For immediate release

The Davie County Planning Department, in conjunction with the North Carolina Department of Transportation, will be conducting a transportation survey of the citizens of Davie County. This survey is intended to receive comments and information from the public about roadways and other transportation in Davie County. Those completing the survey may also comment on traffic problems, specific road intersections, and other areas for improvement, which need to be addressed by the Davie County Thoroughfare Plan. All comments are welcome.

Surveys will be mailed to randomly selected households throughout the County beginning in early December. Approximately 1000 surveys will be mailed and recipients are asked to complete the entire survey and return to the Davie County Planning Department by January 1, 2001. Anyone who does not receive a survey by mail, but would like to complete one, may request a form from the Davie County Planning Department, the County Managers Office, or the Town Halls of the Town of Bermuda Run, Cooleemee, or Mocksville. Copies of the form may also be printed or downloaded from the Davie County website at www.co.davie.nc.us.

Questions regarding the survey may be directed to John Gallimore, Davie County Planning and Zoning, Monday through Friday, 8:30 a.m. to 5:00 p.m. or by telephone at (336) 751-3340.

Goals & Objectives Survey:

DAVIE COUNTY 2030 TRANSPORTATION PLAN UPDATE

Goals and Objectives Survey

A. How important is each of these issues to you? (Please CIRCLE your answer.)

		Not Important	Somewhat Important	Important	Very Important
1.	Construction of roads to promote new industries and jobs	1	2	3	4
2.	Preservation of historic building and sites	1	2	3	4
3.	Reduction of air and noise pollution	1	2	3	4
4.	Preservation of land for future roads, greenways, and sidewalks	1	2	3	4
5.	Planting trees and shrubs along roads	1	2	3	4
6.	Reducing traffic accidents	1	2	3	4
7.	Connecting existing streets	1	2	3	4
8.	Using public transportation	1	2	3	4
9.	Minimizing construction costs of roads	1	2	3	4
10.	Minimizing maintenance costs of roads	1	2	3	4
11.	Improving the timing and coordination of traffic signals	1	2	3	4
12.	Protecting natural areas and open spaces	1	2	3	4
13.	Discouraging use of the automobile	1	2	3	4
14.	Protecting homes and businesses along existing roads	1	2	3	4
15.	Increasing capacity of streets to adequately handle traffic	1	2	3	4
16.	Developing new roads to relieve congestion on existing streets	1	2	3	4
17.	Building a light rail system (commuter trains)	1	2	3	4
18.	Building greenways and sidewalks	1	2	3	4
19.	Building bicycle lanes	1	2	3	4
20.	Providing transportation for the elderly and disabled	1	2	3	4
21.	Protecting neighborhoods from truck traffic	1	2	3	4

B. Would you be willing to use or support: (Please CIRCLE your answer.)

Carpooling/vanpooling	YES	NO
Staggered work hours (working other than 8:00 a.m. – 5:00 p.m.)	YES	NO
Plans which encourage dense urban development in order to encourage the use of light rail	YES	NO
Limits on growth and development in Davie County	YES	NO
Restriction of access along major streets	YES	NO
Expanding bus services	YES	NO
Construction of new freeways	YES	NO
Construction of new major streets	YES	NO
Widening of streets and highways through existing neighborhoods	YES	NO
Living within walking distance of work, shopping, etc.	YES	NO

C. What level of congestion will you accept and live with daily before improvements should be made? (Please check one.)

___ 1. No delay or congestion at any time of day. Free flowing traffic.

___ 2. Little delay during rush hours. Wait of more than one red light occurs occasionally.

___ 3. Some congestion during rush hours. Frequent wait of more than one red light. Driver would consider changing route to avoid congested areas.

___ 4. Moderate congestion even in non-rush hours. Short traffic delays during much of the day.

___ 5. Heavy congestion. Long traffic delays during much of the day.

___ 6. Extreme congestion. Stop and go traffic throughout the day. Gridlock conditions in many areas.

D. Should we spend more or less money on the following? (Please CIRCLE your answer.)

1. Maintaining existing residential streets	Much less	Less	Same	Much more
2. Building new major roads	Much less	Less	Same	Much more
3. Maintaining major streets and highways	Much less	Less	Same	Much more
4. Building new freeways	Much less	Less	Same	Much more
5. Expanding bus service	Much less	Less	Same	Much more
6. Expanding carpooling or vanpooling programs	Much less	Less	Same	Much more
7. Building new sidewalks	Much less	Less	Same	Much more
8. Building new greenways	Much less	Less	Same	Much more
9. Other(*list*):				

E. Is traffic congestion a problem in Davie County? (Please circle your answer.)

Yes ***No***

If yes, list the top three (3) locations (streets or intersections).

1. _____

2. _____

3. _____

F. If additional money is needed to fund transportation projects, would you be willing to vote for: (Please CHECK all that apply.)

___ 1. A gasoline tax increase?

___ 2. Charging transportation fees to develop properties?

___ 3. A local bond referendum?

___ 4. Other (List)?

_____
_____
_____

Household Information:

How many persons live in your household? ____

How many of these persons are 16 years old or older? _____

How do members of your household get to work? (Check the one most used)

__	drive own car or truck	__	ride in someone else's car
__	ride in bus	__	take taxi
__	ride motorcycle	__	ride bicycle
__	walk	__	work at home

Your current residence is in:

Mocksville	___	Davie County	___
Bermuda Run:	___	Cooleemee	___
Other:	___		

What is your age? _____

Goals & Objectives Survey Results:

A. IMPORTANCE OF ISSUES

	NOT	SOMEWHAT	IMPORTANT	VERY
1	75	100	81	65
2	36	91	110	82
3	18	73	111	121
4	31	91	112	89
5	50	100	102	85
6	11	20	72	107
7	77	129	76	37
8	137	125	53	28
9	22	65	116	115
10	15	58	125	115
11	19	62	138	110
12	25	66	92	137
13	134	99	57	29
14	25	68	128	96
15	17	65	139	102
16	37	83	125	85
17	170	69	30	44
18	78	111	80	53
19	124	99	61	35
20	16	67	128	113
21	19	62	118	125

B. WILLING TO SUPPORT

	YES	NO
Car/Vanpool	142	160

St. Wrk. Hrs.	180	165
Dense Dev.	102	200
Growth Limits	223	91
Rest. St. Access	214	88
Bus Sv.	166	122
Freeways	135	160
New Streets	177	117
Widening	164	130
Walking Dst.	151	148

C. LEVEL OF CONGESTION

1. No delay	21
2. Little Delay	135
3. Some Congestion	125
4. Moderate Congestion	48
5. Heavy Congestion	5
6. Extreme Congestion	5

D. SPEND MORE OR LESS

	MUCH LESS	LESS	SAME	MUCH MORE
1. Maint. Exist.	7	19	204	64
2. Build New Major Roads	35	51	125	74
3. Maint. Major St. & Hwy.	5	7	177	92
4. Build New Freeways	60	72	108	47
5. Epand Bus Serv.	65	63	107	54
6. Expand car/vanpooling	40	51	136	54
7. Build sidewalks	45	53	124	71
8. Build greenways	40	48	115	79
9. Other	More traffic signals--no more fast food restaurants--loop or frontis road--wide shoulders for pull-offs--			

E. TRAFFIC CONGESTION		AREAS		
YES	177	801-158-139	801-I 40-36	BERMUDA RUN GATES--33
NO	106	601 south--54	Milling Rd.14	Hwy. 64/601--61

F. ADDITIONAL MONEY	
1. Gas Tax	55
2. Transport. Fee	109
3. Bond Ref.	156
4. Other	22

HOUSEHOLD INFORMATION

	BETWEEN 1 & 3	BETWEEN 4 & 6	7 OR MORE
# PERSONS IN HOME	356	53	
# OVER 16 YEARS	479	127	

	OWN CAR/TRK	BUS	MOTORCYCLE	WALK	OTHER PERSON	TAXI	BICYCLE	WRK HOME
HOW TRAVEL/WRK	230	1		1	2			33

	MOCKSVILLE	BERMUDA RUN	DAVIE COUNTY	COOLEEMEE
RESIDENCE	45	128	137	1

AGE GROUP	16-25	26-35	36-45	46-55	56-65	66-75	76+
	8	21	47	52	60	41	48

Public Information Session Advertisements:

DAVIE COUNTY
THOROUGHFARE PLAN
INFORMATION MEETING

Notice is hereby provided that there will be an information meeting for the citizens of Davie County to review and discuss a proposed **Thoroughfare Plan from 4:00 to 7:00 p.m. at the following dates and locations**:

September 14, 2001	**Bermuda Run Town Hall**	169 Yadkin Valley Road, Suite 100 (in the Travco Center just off Hwy 801 in Hillsdale)
September 20, 2001	**Davie County Administration Building 2nd floor Commissioners Room**	123 S. Main Street in downtown Mocksville, across from the Courthouse
October 22, 2001	**Cooleemee Town Hall**	7766 NC Hwy 801 South, Cooleemee

There is no set agenda for the meeting, so that citizens may visit at their convenience during the designated time.

Officials from the Department of Transportation, who have been involved in the plan preparation, will be available throughout the meeting time to explain information and answer questions. Draft copies of the Thoroughfare Plan will also be available for review.

The Thoroughfare Plan is a long-range (30-year) plan for major traffic circulation arteries throughout Davie County. The document will be used to plan for needed transportation and for development patterns along County thoroughfares.

Interested citizens are invited and encouraged to attend this meeting. Inquiries should be directed to John Gallimore, Planning and Zoning, at 751-3340 between the hours of 8:30 a.m. and 5:00 p.m. Monday through Friday.

Show public involvement opportunities & G/O survey.

Appendix I
Urban Thoroughfare Plans

Thoroughfare plans for the urban areas within the county are shown in the following figures. The only urban area within the county is the Town of Mocksville.

Town	Town Adoption Date	NC Board of Transportation Adoption Date
Mocksville	02/04/1992	03/06/1992

Figures I-1 represents the thoroughfare plan referenced above.

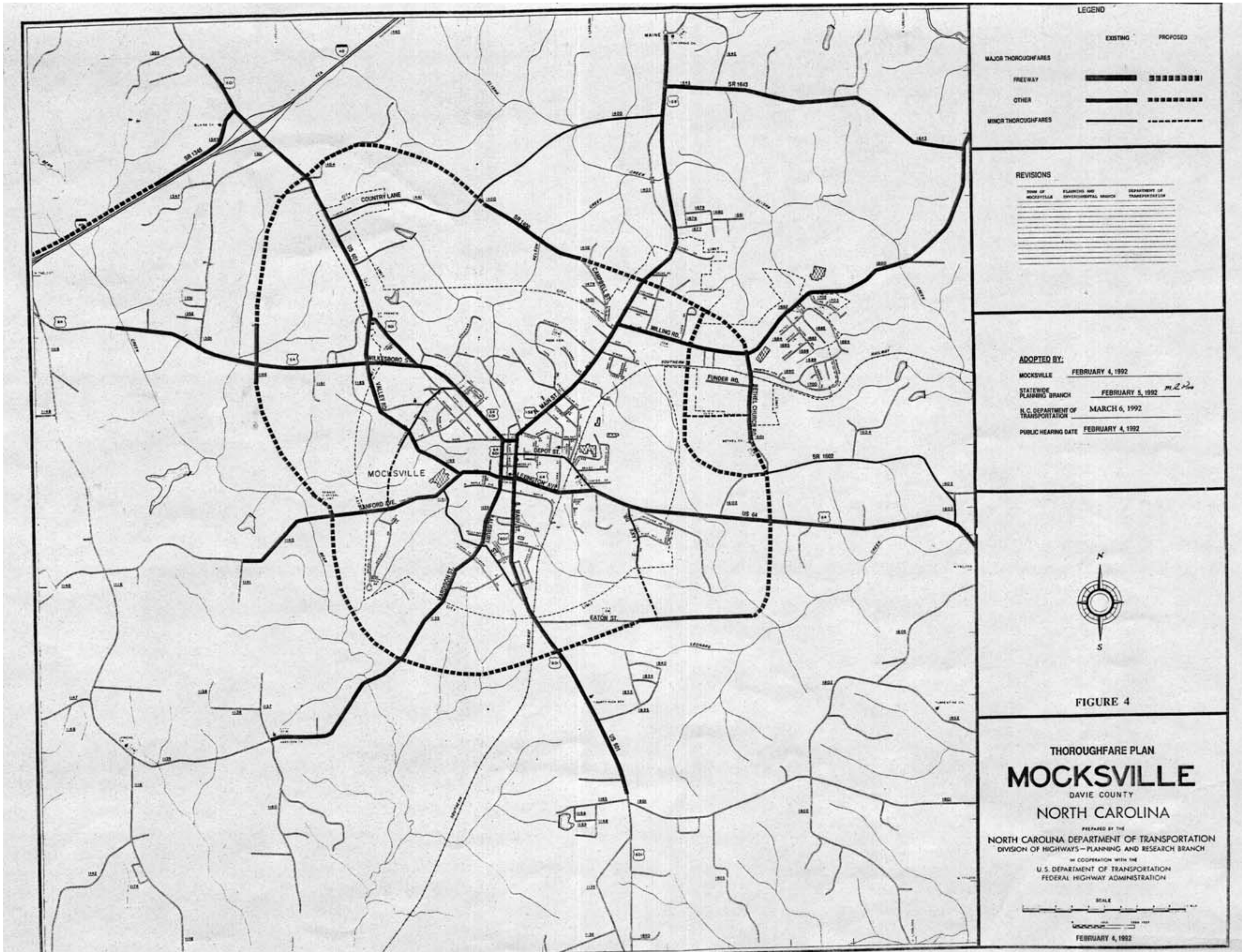

LEGEND
EXISTING
PROPOSED
MAJOR THOROUGHFARES
FREEWAY
OTHER
MINOR THOROUGHFARES
REVISIONS
ADOPTED BY:
MOCKSVILLE FEBRUARY 4, 1992
STATEWIDE PLANNING BRANCH FEBRUARY 5, 1992
N.C. DEPARTMENT OF TRANSPORTATION MARCH 6, 1992
PUBLIC HEARING DATE FEBRUARY 4, 1992
FIGURE 4
THOROUGHFARE PLAN
MOCKSVILLE
DAVIE COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS—PLANNING AND RESEARCH BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
FEBRUARY 4, 1992
COUNTRY LANE
SR 1643
SR 1348
MILLING RD.
FUNDER RD.
DEPOT ST.
MOCKSVILLE
SANFORD AVE.
US 64
SR 1602
EATON ST.

FIGURE I-1

Appendix J

References for Davie County (Division 9)
North Carolina Department of Transportation Contact List

Secretary of the Department of Transportation
Mr. W. Lyndo Tippett
1501 Mail Service Center
Raleigh, NC 27699
(919) 733-2520

Board Member
Ms. Nancy Dunn
485 Shepherd Street
Winston-Salem, NC 27103
(336) 768-1680
nancy.dunn@aladdintravel.com

District Engineer
Mr. Michael C. Shaffner
2135 Cloverdale Avenue
Winston-Salem, NC 27103
(336) 631-1360
mshaffner@dot.state.nc.us

Division Engineer
Mr. S. Pat Ivey , PE
2125 Cloverdale Avenue
Winston Salem, NC 27103
(336) 631-1340
pivey@dot.state.nc.us

Division Traffic Engineer
John P. Couch
2125 Cloverdale Avenue
Winston Salem, NC 27103
(336) 631-1375

County Maintenance Engineer
Mr. John P. Rhyne , E.I.T
181 Westside Drive
Mocksville, NC 27028
(336) 751-2400
jprhyne@dot.state.nc.us

Division Construction Engineer
Keith E. Raulston, PE
2125 Cloverdale Avenue
Winston Salem, NC 27103
(336) 631-1340
kraulston@dot.state.nc.us

Secondary Roads Officer
Mr. Jim Rand
P. O. Box 25201
Raleigh, NC 27611
(919) 733-3250
jrand@dot.state.nc.us

Statewide Planning Manager
Mr. A. Blake Norwood, PE
1554 Mail Service Center
Raleigh, NC 27699
(919) 733-4705
bnorwood@dot.state.nc.us

Triad Regional Unit Head
Mr. Jerry Dudeck, PE
1554 Mail Service Center
Raleigh, NC 27699
(919) 733-4705
dudeck@dot.state.nc.us

Northwest Piedmont RPO
Mr. John Robertson, RPO Coordinator
400 W Fourth St, Suite 400
Winston-Salem, NC 27101
(336) 761-2111
jrobertson@nwpcog.dst.nc.us

Highway Project Funding Sources

Title	Contact
Transportation Improvement Program	Board Member
Secondary Road Improvement Program	Division Engineer
Industrial Access Fund	Secondary Roads Officer
Small Urban Project Fund	Division Engineer

Related Thoroughfare Plans

Thoroughfare Plan	Contact Person	Contact Number
Town of Mocksville 1992	Jerry Dudeck, PE	(919) 733-4705 Ext. 27

RESOURCES AND CONTACTS

North Carolina Department of Transportation

Customer Service Office
1-877-DOT4YOU
(1-877-368-4968)

Secretary of Transportation
1501 Mail Service Center
Raleigh, NC 27699-1501
(919)733-2520

Board of Transportation Member
Current contact information for the Board of Transportation may be accessed from the NCDOT homepage (http://www.dot.state.nc.us/board)
Or by calling the Customer Service Office.

Highway Division
Division specific contact information can be found at http://apps01.dot.state.nc.us/apps/directory/toc.html

Division Engineer
Contact the Division Engineer with general questions concerning NCDOT activities within each Division; information on Small Urban Funds.

Division Construction Engineer
Contact the Division Construction Engineer for information concerning major roadway improvements under construction.

Division Traffic Engineer
Contact the Division Traffic Engineer for traffic related information, including high- collision locations.

District Engineer
Contact the District Engineer for information regarding Driveway Permits, Right of Way, Encroachments, and Development Reviews.

County Maintenance Engineer
Contact the County Maintenance Engineer regarding any maintenance activities, such as drainage and potholes.

Centralized Personnel

Statewide Planning Branch
Contact the Statewide Planning Branch with long-range transportation planning questions.
1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705

Secondary Roads Office
Contact the Secondary Roads Office for information regarding the Industrial Access Funds Program.
P.O. Box 25201
Raleigh, NC 27699
(919) 733-2039

Program Development Branch
Contact the Program Development Branch for information concerning Roadway Official Corridor Maps and the Transportation Improvement Program (TIP)
1534 Mail Service Center
Raleigh, NC 27699-1534
(919)733-2039

Project Development & Environmental Branch
Contact PDEA for information on environmental studies for projects that are included in the TIP.
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 733-3141

Highway Design Branch
Contact the Highway Design Branch for information regarding alignment for projects that are included in the TIP.
1584 Mail Service Center
Raleigh, NC 27699-1584
(919) 250-4001

Public Transportation Division
Contact the Public Transportation Division for information public transit systems.
1550 Mail Service Center
Raleigh, NC 27699-1550
(919) 733-4713

Other Departments
Contact information for other departments within the NCDOT not listed here are available at the NCDOT homepage at http://apps01.dot.state.nc.us/apps/directory/toc.html or by calling the Customer Service Office.